Lacombe
Research Station
1907·1982

Agriculture
Canada

cover photo

Inspection of breeding gilts prior to their release in 1959. The Lacombe breed, developed at the research station, is the only pig breed to originate in Canada

Lacombe Research Station 1907-1982

Howard T. Fredeen

Research Branch
Agriculture Canada

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Foreword

The story of the Lacombe Research Station is an integral part of the history of the central Alberta parklands. The initiative of the Lacombe Board of Trade in their founding year (1904) and subsequently in petitioning the federal Minister of Agriculture for the establishment of an "experimental farm" at Lacombe and their recommendation that it be on the Hiram Flewwelling farm, the site finally selected, were instrumental in establishing the station. In addition, without the insistance of Dr. W. Saunders, the first director of the Experimental Farms Service, that the Flewwelling farm was the best site for an experimental station in central Alberta, the Lacombe station might have been located elsewhere.

Initiative, hard work, dedication, and service to agriculture have characterized the efforts of the directors and their staff over the past 75 years. These efforts have played an important part in shaping agricultural practices, initially in the central Alberta parklands, by providing information on new techniques, new methodology, and new management practices in plant and animal sciences. However, as problems became more complex and as programs evolved, the research efforts of the station's scientists have had a major influence on national agricultural problems and programs. Research workers have developed new plant gene material in cereal, forage, and horticultural crops and new animal gene material in swine and cattle, and they have studied the pathology of cereals and forage crops and evaluated candidate herbicides. In addition, through integrated research on animal breeding and meats, the station has made a major contribution to Canada-wide departmental beef and swine carcass grading programs, and national beef and swine production testing programs (ROP). Indeed, as a result of programs conducted in the past 20 years, the station has been recognized internationally for its research in plant and animal science.

In the early years, most of the information arising from research conducted at Lacombe was transferred to the farmers and provincial agricultural personnel through talks at field days and farmers' meetings, and in bulletins, letters, and annual reports. Since the early 1950s more research information has been published in national and international scientific journals, technical bulletins, proceedings, and similar publications as well as in releases to farmers, agribusiness, provincial extension agencies, press, radio, and television.

New technologies in agricultural production have been adopted by both farmers and industry, and farming practices are now highly mechanized and specialized. Investments are high, and as a result, economic and efficient production systems are paramount. However, as agricultural production has become specialized, production problems have become more complex. Solutions to these problems require a multidisciplinary approach by scientists as well as the use of innovative techniques and sophisticated equipment. The Lacombe Research Station has responded to the demands of farmers and industry by establishing new research programs over the years and by recruiting scientific and support staff with the expertise to solve these problems. Today, scientists highly trained in basic sciences—animal and plant genetics, physiology, pathology, microbiology, biochemistry, soil chemistry, and computer sciences, to name a few—along with their support staff, form the core of the multidisciplinary groups responsible for developing crop and animal production systems and solving basic problems of production and processing.

Although both the complexity of farm production problems and the expertise required to resolve them have grown since the station was founded in 1907, we should recognize the contribution made by the scientists and staff over the decades. In retrospect, their achievements were as great in relation to the problems of their day as are those of today's staff in the face of current problems.

In order to capture the many contributions made to agriculture over the past 75 years by the Lacombe Research Station staff, I asked Dr. Howard Fredeen to write the station's history. Howard has worked at the Lacombe station for the past 35 years with many members of earlier staffs, and he has attained national and international recognition in large animal genetics.

Dr. Don Waldern, Director (1980–present).

In the chapters that follow he has outlined the development of the station from early agriculture in the region to present-day intensive scientific research programs. Some humorous anecdotes about personalities and philosophies of early directors and staff are also captured and will be of interest to all readers. In all the history that is related, the dedicated efforts of the staff and their achievements to serve agriculture stand uppermost.

D. E. Waldern

D. E. Waldern
Director
Research Station
Lacombe, Alberta

November 25, 1982

CHAPTER 1

Prelude to Western Agriculture

The history of agriculture in Western Canada began on 30 August 1812. On that date, Miles Macdonell and his band of 23 men arrived at the confluence of the Red and Assiniboine rivers on the eastern margin of the vast Canadian Northwest Territories. This party, the advance guard of the Selkirk settlers, brought with them 1½ bushels (41 kg) of precious seed wheat from Scotland and two cattle obtained from one of the Hudson's Bay posts en route from York Factory. The two animals were appropriately named Adam and Eve.

The Selkirk project was conceived by Thomas Douglas, Fifth Earl of Selkirk, in a proposal advanced to the British government in 1803. His vision was agricultural settlement, and it won some measure of support on the basis that the settlers could provide protection for British interests in North America. But the venture was received with something less than enthusiasm by officers of the Hudson's Bay Company. Their business was fur and they viewed the endless prairie to the west of Hudson's Bay as vital to the success of this business. It sustained the vast herds of bison on which much of the company's fur supply and the western Indian culture depended. The same herds also served as the prime food source for HBC employees located at scattered trading posts westward to Rocky Mountain House. In their view, agricultural settlement would do nothing but disrupt the useful productivity of the grassland.

Early results at the Selkirk settlement did not modify this view. The first crop of winter wheat, planted in hand-dug plots in the fall of 1812, failed to survive the winter. Spring wheat, too, failed to produce in 1813 and results the following year were no better. Only by virtue of high yields of potatoes and turnips were the settlers encouraged to continue. Optimism returned with good crops of wheat and barley in 1815, but the 1816 crop froze and grasshoppers destroyed the crops in the two following years. New seed was obtained from Wisconsin—an importation involving a long winter journey by snowshoe—but not until the crop year of 1824, the 12th year after initial settlement, was there cause for jubilation. In that year a yield of 68 bushels per acre (4.5 tonnes/ha) was recorded from ground prepared by hand hoe.

Then followed two more disastrous years. Mice destroyed the total crop in 1825, and in 1826 an unprecedented spring flood inundated all dwellings in the community. Farms, surveyed in 1813 by Peter Fidler, lay in long narrow strips fronting on the Red River. Dwellings built adjacent to the river "highway" were vulnerable to floods associated with spring breakup, and an entry in the Company journal at Fort Garry noted that 47 houses were carried away by river waters on 5 May 1826.

George Simpson, the Governor of the Hudson's Bay Company post, was convinced this would prove the end of the colony. In a letter to his London colleagues dated 14 June he said: "A calamity of the most unforeseen nature presented itself, one which I conceive to be a death blow to the colony." In this judgment, he underestimated the stubbornness of the people. Instead of leaving, they rebuilt; the hand hoes were replaced by plows; gristing of flour began, using wind power; milk cows, sheep, and horses were imported; and the community even wrung grudging support from the Hudson's Bay Company in the form of storage for grain produced. The area farmed gradually increased and the census of 1849 recorded a total of 6392 acres (2589 ha) under cultivation.

Despite modest support from Governor Simpson, the official Company policy continued to oppose agriculture. Even as late as 1857, Sir George Simpson proclaimed to the British government that no part of the Hudson's Bay Territories was adapted to settlement—including the district of the Red Deer River. His testimony, given before a committee of the British House of Commons, emphasized the "poverty of the soil" which, apart from scattered areas along the banks of rivers, he considered incapable of providing any means of sustenance.

Some witnesses fully supported Simpson's opinion but others differed, and in the end the committee recommended an on-the-spot evaluation by a scientific expedition. Captain John Palliser was chosen to head this mission and on 15 May 1857 he and his party left Liverpool on the steamship Arabia. The British government, desiring a quick resolution of the issue, expected Palliser to return within 18 months. He did not return until June 1860, and his final report was not presented to Parliament until 19 May 1863. By that time the sense of urgency had diminished and his report received scant attention. However, it tended to support the contentions of the Company. Palliser did define a fertile belt extending in an arc from Fort Garry to Fort Edmonton, then south along the mountains, but he recorded the vast area of grassland within the arc as generally unfit for agriculture.

This judgment of what has since become known as the Palliser triangle was supported in part by the Hind report. Henry Youle Hind, Professor of Geology at Trinity College, Toronto, who surveyed the area in 1858 at the request of the Government of the Province of Canada, reported that permanent settlement would be precarious because of climate, soil, and lack of fuel. However, he visualized a dam on the South Saskatchewan River near its elbow that could serve both transportation and agriculture.

Hind's report, like that of Palliser, languished. The burning issues in Canada were confederation, realized in 1867, and the negotiations for purchase of Rupert's Land from the Hudson's Bay Company. This was consummated in 1869 and the Prime Minister of Canada, Sir John A. Macdonald, moved swiftly to establish a Canadian "presence" from ocean to ocean. As he stated in one of his letters of that period:

"I would be quite willing, personally, to leave that whole country a wilderness for the next half century but I fear that if Englishmen do not go there the Yankees will."

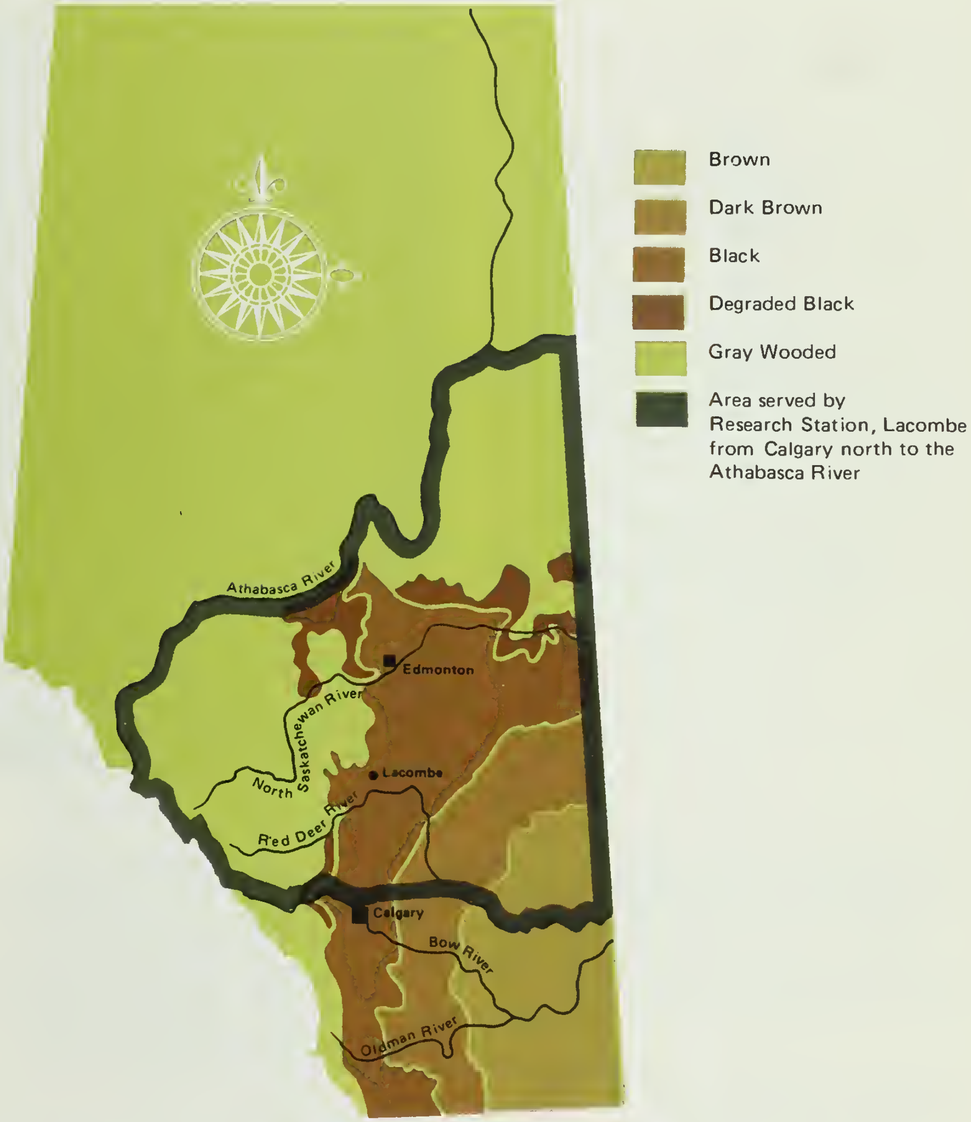
Thus was born the vision of the Canadian Pacific Railway, and with it a third report on the agricultural potential of the West. In some respects, this report might be considered the first authoritative paper on the subject. First, the man responsible was Professor John Macoun of Albert College, Belleville, Ont., who, unlike his predecessors, was a trained botanist. Second, his six trips through the West were made in years of favorable weather, a contrast with the drought prevailing in the period 1857–1860. He was highly optimistic, citing grain yields of 55 bushels per acre (3.7 tonnes/ha), cabbages growing to 49 pounds (22 kg), and squash the size of a rainbarrel. In one of his several reports he estimated the prairie region to possess 80 million acres (32 million ha) of arable land with a matching area of native pasture. At one stage he wrote:

"What in the spring of 1880 is a vast prairie will in the spring of 1882 be alive with settlers, its solitude and loneliness gone forever."

Suddenly, it was fashionable to praise rather than condemn. Money borrowed to buy Rupert's Land had to be repaid and for this reason—as well as to provide people and goods to utilize the yet-to-be railroad—the government embarked on a "free land" policy to attract settlers. Well, almost free. For a fee of $10 a prospective settler could file on a quarter-section (65-ha) homestead with the option to "pre-empt" a second quarter of Crown land for a price of $2 per acre (0.4 ha). To qualify for ownership of the homestead quarter a man was required to establish residence and make specified annual improvements over a period of 3 years. In the words of some early settlers, the government bet 160 acres against $10 that you couldn't stick it 3 years.

These homestead regulations were authorized by Order in Council in 1871, 2 years after the Dominion Land surveyors had moved into the Red River district to begin the long job of marking the land into 36-section townships with each section comprising four designated quarters of 160 acres (65 ha). As the survey moved westward the railroad followed, reaching Winnipeg in 1881 and Calgary in 1883. And with the railroad came the settlers, first into Manitoba, which was granted provincial status in 1870, then into the broad central plains of the Northwest Territories, and finally to the western margin of these plains in the shadow of the Rockies. Here they joined with immigrants who had traveled north by covered wagon from the western United States, and with established cattlemen whose herds in some instances had originated as far south as Texas.

Initially, these settlers had neither the incentive nor the desire to homestead too far north of the Canadian Pacific Railway line. Free land was abundant, but the difficulties of family travel by oxcart and wagon over tractless wilderness discouraged all but the most hardy bachelors. Among the latter was Ed Barnett, a former Royal North-West Mounted Police constable. He took his discharge on 2 August 1881 at Fort Walsh and in his words "was persuaded by Col. McLeod and Col. Ervine to go north and help open up the country." He chose to settle on an unsurveyed parcel of land approximately 100 miles (160 km) north of the 16 log houses that then comprised the tiny trading post of Calgary.



Principal soil zones of Alberta and area served by Lacombe Research Station.

The land survey of central Alberta, begun in 1883 when C. A. Magrath laid out the township outlines, was completed the following year by M. J. Charbonneau. The land chosen by Barnett was duly described as SE ¼ Section 30, Township 40, Range 26 W of the 4th Meridian and was gifted to him by the Canadian government in recognition of his years of service to the RNWMP.

Barnett's brother Jack joined him for the summer of 1883, having walked from the end of steel at Moose Jaw, Sask. His stay was brief but 5 years later he returned with his wife, the first white woman in the area. The next women did not arrive until late 1891 when the Calgary–Edmonton railroad was completed to this point.

Siding No. 12 was constructed here and by 1893 the community boasted a population of 25. Shortly thereafter it was named Lacombe in honor of a frequent visitor, the renowned Catholic priest, Father Lacombe.

The handful of settlers around Siding No. 12 in 1891 included Peter Talbot, who became a leading farmer, a master breeder of Shorthorn cattle, a respected leader of early farming organizations, and a successful politician and Senator. He was an organizer and officer of the fledgling Lacombe Board of Trade which successfully promoted establishment of a Dominion Experimental Farm in the community.

CHAPTER 2

Early Agricultural Experimentation in Canada, 1812 to 1907

Viewed in retrospect, the Selkirk settlement of 1812 was itself a grandiose experiment in agriculture; but during its formative years there were three specific attempts to develop experimental farm units. The first, in 1821, was to be a dairy farm. The second, in 1831, was to test and demonstrate "modern" equipment for cropping, but it also included a dairy herd and a stallion, Fireaway, imported from England. The third attempt, in 1838, was to specialize in sheep production. Fireaway, presumed to be of Hackney breeding, was both a star attraction and the sire of many fine foals out of Indian ponies. Apart from this one success, the experimental units attracted little support from the settlers and this endeavor was abandoned shortly after 1838.

The next record of agricultural experimentation in North America comes from Michigan in 1857. This began as an integral part of the student training program at the agricultural school, and a similar program began at Ste. Anne de la Pocatière, Lower Canada, in 1859.

Confederation in Canada was followed within a year by an Act for organization of the Department of Agriculture. This Act, given assent on 22 May 1868, assigned nine specific areas of responsibility to one Minister, including agriculture, immigration, census and statistics, manufacturing, and public health. A broad portfolio indeed, but the Minister proved equal to the task when he combined public health and agriculture in his first legislative proposal, "An Act Respecting Contagious Diseases of Animals."

The new Department's initial venture in agricultural research took the form of investigations conducted jointly with the Ontario Agricultural College, founded in 1873. By 1884, the inadequacy of this arrangement had become apparent and a select committee headed by G. A. Gigault, M.P., was named by the House of Commons to investigate means for supporting and improving agriculture. Receipt of his report led to the appointment of Professor William Saunders of the University of Western Ontario at London to review experimental stations elsewhere in the world with specific emphasis on those in the United States. His report of 29 February 1886 was presented to Parliament by Hon. J. Carling on 15 April with a bill titled "An Act Respecting Experimental Farm Stations." This legislation had swift passage, receiving Royal Assent on 2 June 1886. It authorized establishment of five experimental farms, with the one for Ontario and Quebec to be designated as the Central Farm. It also provided for land to be set aside in the West for forestry and tree planting, a provision that recognized the section of the Saunders' report dealing with botanic gardens and forestry work in other countries.

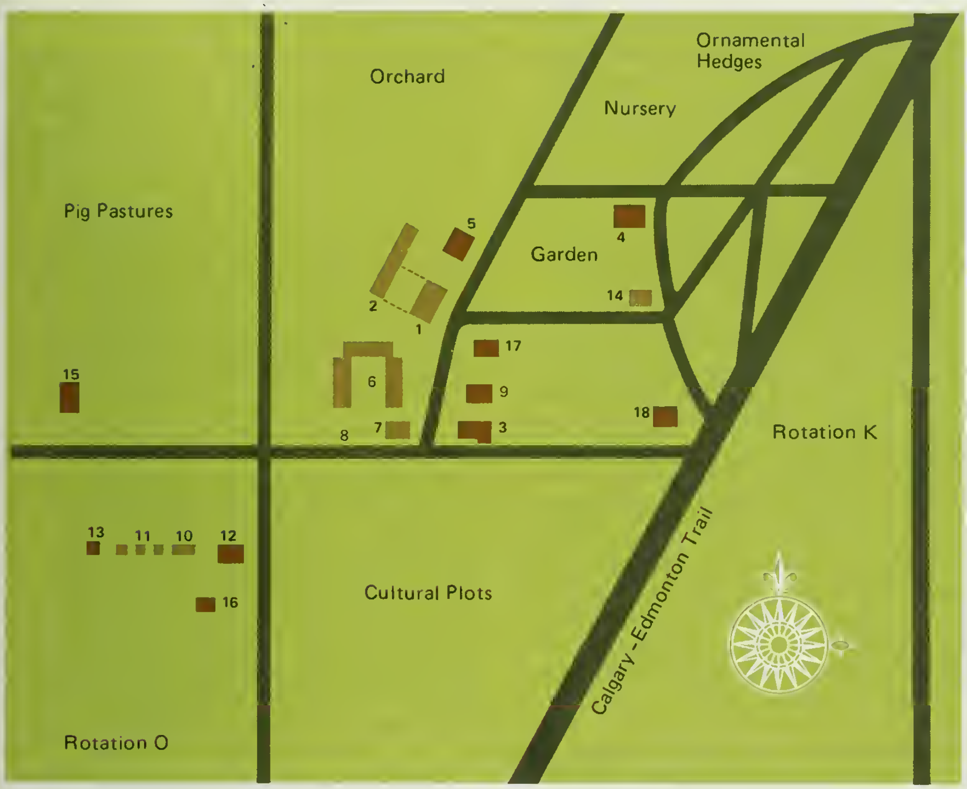
Dr. Saunders was an exceptional man. Self-taught—his formal schooling ended at age 12—he possessed abilities that were best described by his successor, Dr. J. H. Grisdale:

"A man who could, after leaving school at 12 or 13 and going into business for himself at 18, achieve distinction in botany, entomology, horticulture, analytical chemistry, plant breeding, materia medica and manufacturing chemistry by the time he was 40 years old, must surely be considered as a man of most extraordinary ability and marvellous industry. All this, and more besides, was done by Dr. Saunders."

His degree, LL.D., was honorary, one of the several high honors bestowed on him in recognition of his immense scientific achievements. On 12 October 1886, at age 50, he was appointed Director of the new Experimental Farms Service, a role he filled for the next quarter-century.

His headquarters were located on a 466-acre (189-ha) site of stumps and rocks adjacent to the national capital, Ottawa. Clearing land and constructing buildings for this Central Experimental Farm began immediately. While this work was in progress, Dr. Saunders commenced a series of tours to inspect sites for the four branch farms authorized by Parliament.

Thoroughness characterized all of Dr. Saunders' activities and his selection of branch farms was no exception. He traveled widely, visiting each site at least three times before reporting on its suitability. His choice in the Maritimes was Nappan, Nova Scotia (1887), and the three western sites which commenced operations in 1888 were at Brandon, Manitoba; Indian Head, Northwest Territories; and Agassiz, British Columbia



1	Horse Barn	(1907)
2	Implement Shed	(1907)
3	Boardinghouse	(1907 No. 15)
4	Superintendent's Residence	(1907 No. 22)
5	Cereal Building	(1908 No. 18)
6	Cattle Barn	(1912)
7	Dairy Manufacturing	(1912)
8	Icehouse	(1912)
9	Herdsman's Residence	(1912 No. 16)
10	Poultry House (Straw)	(1912)
11	Colony Houses	(1912)
12	Poultry Administration	(1913 No. 30)
13	Log House (Pre-1900)	(1913 No. 31)
14	Office	(1914 No. 3)
15	Piggery	(1915 No. 25)
16	Poultry Service Building	(1916 No. 32)
17	Foreman's Residence	(1920)
18	George Delong's Residence	(1920 No. 23)

Main buildings of the Lacombe Research Station.

His first priority was the demonstrational testing of crops, cultural practices, crop rotations, livestock housing, nutrition and management, and the use of manure as fertilizer. An integral component of the demonstrational work was the planting of shelter belts at all farm locations and landscaping of the grounds with trees, shrubs, perennials, and annual flower beds. Dr. Saunders reasoned that attractive surroundings would invite interest and attention in all of the experimental activities and would also serve to demonstrate the potential for farmstead beautification.

But the need for research was not overlooked. The country was new, growing conditions varied widely across its vast expanse, and Dr. Saunders was alert to the possibility that technology borrowed from abroad—or from Ottawa—would not necessarily satisfy all requirements of Canadian agriculture. His early experiments were concerned with identifying the plot size required to objectively evaluate the production potential of borrowed technology in plant varieties and cultural methods. The results indicated a size of 1⁄40 acre (100 m^2) which he then adopted at all experimental farms. Cognizant of the hardiness required for plant production in Canada, he imported from Russia seed of the Siberian crab apple, the Siberian pea tree or caragana, and numerous varieties of cereal and forage crops. By 1889 he had begun crossbreeding experiments to evolve new varieties adapted to Canadian conditions. Three examples, the caragana and hardy apples now grown on the prairies and Marquis wheat, suffice to demonstrate the success of these pioneer experiments.

Dr. Saunders, during his first year as Director, gave particular attention to horticultural and cropping trials, but by 1888 he had broadened activities to include various species of farm livestock and poultry husbandry. All activities concerned with animals quickly became an integral part of the work at each location.

Public response to the five experimental farms was gratifying. In his 1905 report to the Department, Dr. Saunders noted that an average of 300 000 reports and bulletins, plus 68 797 letters responding to specific enquiries, had been mailed to farmers annually during the previous 7 years.

This apparent success had not escaped the notice of the Department and, as early as 1900, the Act to establish the five experimental farms had been amended to permit extension of the system. The one distinction between the original five and those that might be added was that the latter would be designated as experimental stations, not farms.

* * *

CHAPTER 3

Establishment of the Lacombe Experimental Station

Hudson s Bay Company trading posts at Fort Edmonton and Rocky Mountain House were the first white settlements on the western fringe of Rupert's Land. Travel into Fort Edmonton initially followed the north fork of the Saskatchewan River, but at an early date this route was supplemented by a trail leading south to Fort Benton on the Missouri River. After establishment of Rocky Mountain House in 1800 this new trading post was served by a branch of the Fort Benton trail leading west from a point about 100 miles (160 km) south of Fort Edmonton. Another branch from this same point served the area eastward around Buffalo Hide Lake.

Missionaries followed hard on the heels of the fur traders. First among them was Father Lacombe, a young Catholic priest who came up the Fort Benton trail in 1854. Eight years later he brought supplies up this trail by oxcart to furnish his new mission on the site now known as St. Albert.

This was a new mode of travel over a trail developed by traffic on foot and horseback, and it was viewed with interest by the Hudson's Bay Company. In 1867 they tried it, bringing in a train of 80 carts to supply Fort Edmonton. Their trial run was considered successful and the cart was adopted as the mode of transport.

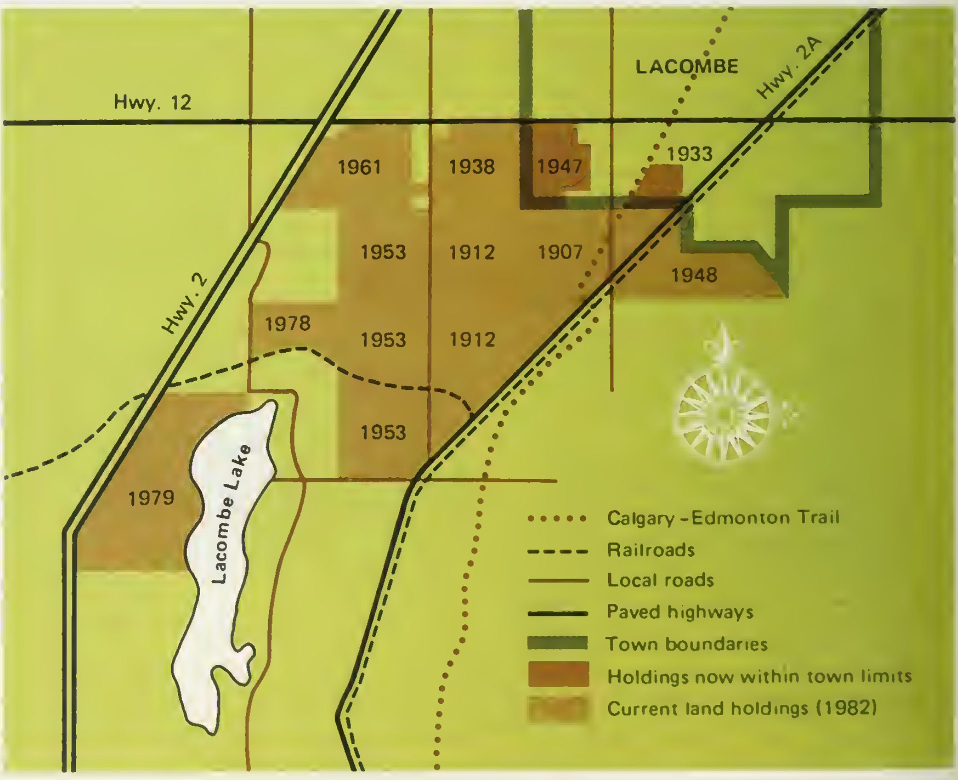
However, it remained for Rev. John McDougall and his brother David to make the first serious attempt at trail improvement. During 1873 they cut a cart trail from Fort Edmonton to their mission at Morley, widening it as required and bridging boggy spots with corduroy. With establishment of the community of Calgary this became known as the Calgary–Edmonton Trail. It soon became a thoroughfare of such importance that the Northwest Territorial government requested it be surveyed. The Dominion government responded in 1886 by assigning their surveyor, George P. Roy, the task of providing the legal description of a "public thoroughfare that could not be fenced off or obstructed in any way." Writing later about his survey, Roy said:

> *"In view of the great traffic and increased travel which may some day be done this way, my intention was to make the road as straight as the actual direction of Trail between the two extreme points would allow."*

Apart from minor deviations, the route he defined followed the historic trail and the railroad that pushed north from Calgary in 1890 closely paralleled Roy's survey line. It was near the confluence of this route with the historic branches east to Buffalo Hide Lake and west to Rocky Mountain House that the railroad chose to place the siding designated Number 12. This choice had much to do with subsequent development of the community that came to be known as Lacombe.

In 1892, a Dominion Land Office was opened at a site where the Calgary–Edmonton Trail crossed the Red Deer River. It processed 3134 title applications that year and the number of houses at Canadian Pacific Railway Siding No. 12 increased from 2 to 16 in a single year. On 16 April 1896, the residents of this community, now named Lacombe and populated by 125 people, petitioned the Territorial government in Regina for incorporation as a village. The petition was granted 10 weeks later and Lacombe became the eighth community to gain official recognition within the area destined to become Alberta. Preceding it were the towns of Lethbridge (1891), Edmonton and MacLeod (1892), and Calgary (1893), and the villages of Strathcona (1893), Red Deer (1894), and Medicine Hat (1894).

By 1900 Lacombe, with a population in excess of 100 people, was considered larger than Red Deer. In 1902, it was incorporated as a town and by 1905 its population was 900.



Land holdings of Lacombe Research Station.

That this rapid growth derived from its strategic location did not go unnoticed by its residents. Cognizant of the importance of east–west trade, the businessmen directed attention to road building. On 26 April 1904, they convened a citizens' meeting in Mobley's Hall to explore means for advertising the community and to discuss road improvement. A subsequent meeting decided to seek authority from the Territorial capital at Regina for incorporation as a Board of Trade. This was granted and the certificate of incorporation was presented to a meeting held 23 November 1904.

Road construction was the first order of business, but the group also had an eye on bigger things. Two weeks after incorporation the president, Mr. R. F. Taylor, struck a committee to prepare "a memorandum re establishment of an Experimental Farm." This was submitted to the Hon. Sydney A. Fisher, Minister of Agriculture, in December 1904 with the recommendation that the Hiram Flewwelling farm, bordering the southern boundary of the town, be purchased for this purpose.

The ministerial response was slow. Meanwhile, according to the minutes for 7 February 1905:

"a communication was received from the Edmonton Board of Trade asking the cooperation of the Board in securing the location of the provincial capital at Edmonton."

Mr. W. F. Puffer, a member of the Board, took note of this request from Edmonton when he was elected to the first provincial legislature in 1905. In the political "horse trading" preceding the choice of a capital city he offered his support for Edmonton if, in turn, other members favoring that location would lend their support for Lacombe as a site for an experimental station. They agreed, and when Edmonton was designated the capital of Alberta, the option of political support for an experimental station at Lacombe became viable.

Lacombe was not the only Alberta community presenting a case for an experimental station, and the Minister of Agriculture finally responded to these requests in August 1905 with his direction to Dr. William Saunders, Director of the Experimental Farms Service, to evaluate locations at Calgary, Edmonton, Lacombe, Lethbridge, Innisfail, and Red Deer that had been proposed as "sub-station sites" in the new Province of Alberta. By letter dated 9 September 1905, written on the letterhead of the Alberta Hotel in Calgary, Dr. Saunders advised the Minister of his findings. At his first stop, Calgary, he met Mr. J. S. Dennis, Superintendent of Irrigation for the Canadian Pacific Railway, who advised there would be no difficulty in providing free land with irrigation potential. At Lethbridge, Mr. Elliott T. Galt, General Manager of the Alberta Railway and Irrigation Company, went one better by offering free water in addition to free land. Parties contacted at Edmonton were not ready to discuss the matter but at Lacombe Mr. Peter Talbot, M.P., showed him two sites, one an unimproved school section and the other an improved quarter owned by Flewwelling. Both Saunders and Talbot favored the latter, which bordered the south boundary of the town. No suitable site was found at Red Deer, but one at Innisfail was rated as very good soil.

The Minister was duly impressed by the prospects of free land but he and his Deputy Minister, Mr. O'Halloran, seemed oblivious to the fact that all free land at Lethbridge was unbroken prairie sod whereas the Lacombe site was an improved quarter with 130 acres (52.6 ha) of cultivated land. Also overlooked was the background of the benevolence in southern Alberta; the gift of land offered at Lethbridge was simply the return of a negligible portion of the million acres (405 000 ha) previously granted to the Galts by the Government of Canada as a reward for their railway building activities.

Following Dr. Saunder's visit, Mr. Fisher wrote to the Lacombe Board of Trade requesting additional information. This was provided but the Minister reiterated his concern about cost and on 23 January 1906, the Board sent him a plan of the district showing established land values, and cited the following resolution of their executive:

"In the opinion of the Board of Trade of Lacombe, the price asked by Mr. Flewwelling for this land, $50 per acre, is not in excess of its value, being on a parity with prices that obtain in the immediate district, and considering that it is the most desirable farm property in the vicinity."

Hiram Frances Flewwelling and his wife Mary, original owners of the land purchased for the farm. Their homestead title was dated 1895.

At this point, the Minister made known his opinion that the Lacombe Board of Trade, if of serious intent, should purchase the property and gift it to the Government. This was seriously considered but the Board response, dated 3 March 1906, contained the following statement:

". . . and while the public bodies here would contribute some part of the purchase price, rather than see the deal fall through, we would feel that such small contribution would bear so much harder upon our small revenues than it would assist the surplus in the Dominion Treasury, that it should not be required of us. But as already stated, the supporters of your Government in this district know that the price asked for is not too high, and we feel it our duty to advise you that the disaffection among them will be serious if the claims of this district for the Experimental Farm are not recognized."

Although this was the written response to the Minister, the Board did take steps to secure the property. Minutes of a subsequent meeting reveal that its members personally subscribed the funds required, $8000, to purchase the land from Mr. Flewwelling, who had decided to relocate in British Columbia. However, a motion "that same be offered to the Department at $2000 whether or not a higher price has been paid" was lost.

Apparently the Minister's view did moderate because, on 22 July 1906, Dr. Saunders wrote him to say "I was very glad to get the telegram from Mr. O'Halloran advising me that the appointment of a Superintendent for the Lacombe Farm had been made and that Mr. Hutton would meet me in Lacombe." It is interesting to note this preceded by 2 weeks the appointment of a Superintendent for the second western experimental station located at Lethbridge.

But the appointment of Mr. Hutton did not mean the end of price negotiations and the Minister once again sent Dr. Saunders to Lacombe with instructions to locate "the experimental farm for northern Alberta" on the unimproved school section examined the previous year by Saunders and Talbot. Dr. Saunders' second evaluation contained in a seven-page letter written 9 August 1906, from the Adelphi Hotel in Lacombe, was exceedingly thorough but the immediate telegraphed response from the Minister read "If you remain of opinion school section unsuitable matter must stand. Will not purchase Flewwelling property without looking further." This ministerial position was confirmed by letter to the Lacombe Board of Trade dated 12 October 1906, in which Mr. Fisher stated the Flewwelling price was prohibitive and other communities would undoubtedly provide free land.

It seemed clear to members of the Board that they could do no more. But Bill Puffer had not played his trump card, the pledge he had received from his fellow Liberals in the provincial legislature for the support he had given to Edmonton as the site of the provincial capital. On 2 January 1907, the Premier of Alberta, the Hon. A. C. Rutherford, addressed a letter to "My Dear Sir Wilfred" requesting favorable consideration of the Flewwelling site.

Whatever else may be said about the primitive conditions of these pioneer days, the mail service was certainly prompt. The Prime Minister's response, dated 8 January 1907, read:

"My dear Rutherford, –

I have your favor of the 2nd instant. Fisher would be quite willing to meet your views and to place the Experimental Farm at Lacombe, and he is disposed to go in that direction as far as it is possible to do. He thinks, however, that the price asked for the land offered is unreasonable and that he can have as good and perhaps better land elsewhere for much less money. You will admit that under the circumstances it is a quite strong argument.

Yours very sincerely.

WILFRED LAURIER"

One month later Mr. Fisher advised the Member of Parliament from Central Alberta, Dr. Wilbert McIntyre, that he would authorize purchase to a limit of $5000. Dr. McIntyre responded 5 days later saying Mr. Puffer had arranged the balance and the deal received Cabinet approval on 25 February 1907. The land cost $8000; the government paid $5000 and the balance was covered by contributions of $50 to $100 from a number of local citizens plus substantial donations by Peter Talbot, Bill Puffer, and Mr. Hutton. Mr. Hutton was confirmed immediately as Superintendent at a salary of $1200 per annum.

So ended the long negotiations instituted by the Lacombe Board of Trade, in late December 1904. In retrospect, it is worthy of note that the agricultural potential of the school section rejected by Dr. Saunders lived up to his expectations. Eventually, three of the quarters were acquired by the Town of Lacombe. One was developed as a sewage lagoon and the other two, after considerable expenditure for leveling and filling of sloughs, are being developed as building sites.

CHAPTER 4

The Early Years, 1907 to 1919

Within his first week at Lacombe, Mr. Hutton had obtained a blueprint for house construction, including full electrical wiring, from local contractors John Patten and Alex Able. Their tender of $3155 was submitted to Ottawa on 9 August 1906. Acting on instructions from Ottawa, he also negotiated purchase of horses and farm equipment. Four young Clydesdale mares, one in foal, and a team of 4-year-old drivers bred by Rawlinson Bros. of Calgary were obtained for $1800, and a complete line of farm machinery was purchased for $2429. The equipment included a soil packer, an implement new to Western Canada. Since land purchase had not been authorized, he arranged to winter the horses on his own farm about 1 mile (1.6 km) distant from the Flewwelling property.

Farm development 1907–1908

Mr. Hutton had arranged for 60 acres (24.3 ha) of plowing in the fall of 1906. With the coming of spring in 1907, this land was disked, harrowed, and packed, and seeding commenced on 1 May. All the cereal crop plots for 125 experiments with spring wheat, oats, and barley were seeded by 10 May. This was followed by seeding of 40 varieties of field peas and Indian corn, and various root crops including 22 varieties of turnips and mangels, 6 of carrots, 3 of sugar beets, and 17 of potatoes. Each test plot was 1⁄60 acre (70 m^2) in size. Also planted were 3 acres (1.2 ha) of red clover and 1 acre (0.4 ha) of alfalfa. Part of the land under alfalfa was inoculated with soil from established alfalfa fields in the Lethbridge area, obtained courtesy of Mr. W. H. Fairfield of the Lethbridge station, and the balance was left untreated as a check plot. Experiments were also conducted on seeding rates for turnips and oats and a special test was laid out to compare oat yields from plots packed after seeding with those left unpacked.

With seeding completed for approximately 40 acres (16.2 ha) of experimental plots, the next activity was the planting of 350 fruit trees provided from Ottawa. These included 152 varieties and selections of apples, 20 of plums, and 3 of cherries. In addition, there was a collection of raspberries, gooseberries, strawberries, and three species of currants. Finally, a nursery of several thousand specimens of Manitoba maple, caragana, cottonwood,

above
The pre-1897 log dwelling renovated for use as one of the first poultry houses (1936 photo).

below
Winter housing for the original sow herd in 1913.

above
The first three buildings in the spring of 1908, viewed from the southwest toward the town of Lacombe. At extreme left, the barn under construction was the first building erected by the Agricultural Society.

opposite page • above
Mr. Hutton introduced the soil packer to Western Canada: late-fall view southeast across the building site about 1918.

opposite page • center
Harvesting the wheat crop; binder followed by disc harrow.

opposite page • below
Threshing plots with the stationary grain separator used from 1915 to late 1920s.

Colorado spruce, balsam fir, and many varieties of shrubs were planted. This nursery was designated as the source of material for planting windbreaks and avenues on the station.

Tenders for construction of buildings were let in March 1907. The first item completed was for staff accommodation. The main building, measuring 25 feet by 32 feet (7.6 × 9.8 m), had a full basement with poured concrete walls and an addition measuring 13 feet by 16 feet (4.9 × 6.1 m) designed to serve as the kitchen and eating room. The unit housed five workmen and the boardinghouse keeper and cost $1944.98. (This building still stands, as building No. 15.) The next building was a barn, 70 feet by 40 feet with 18-foot walls (21.3 × 12.2 × 5.5 m) and a 10-foot (3.0-m) hip-roof. The construction cost for this combination stable, drive house, and workshop with overhead feed storage and an inside well, 40 feet deep (12.2 m), was $2031. Mr. Hutton's report to Ottawa read:

"The lumber, hardware, building paper, gravel and cement was estimated to cost $1524.65 and labor $505.35. Gravel cost $3.00 per yard delivered while lumber and cement was also high priced. No. 1 material only was used."

A shed 60 feet by 20 feet (18.3 × 6.1 m), with the long dimension fitted with sliding doors, was erected for implement storage. This was connected with the barn by 8-foot (2.4-m) board fences to provide an enclosure for stock.

By October 1907, the Superintendent's residence–office–guest house had been completed. This building, except for the kitchen wing, had a full basement with concrete walls, was two stories high, and was equipped with a hot-air furnace and electrical wiring. The water supply was pressurized by use of a windmill erected over an outside well, and sewage disposal was to a cesspool. This building, renovated in 1947, still serves as the Director's residence and is identified as building No. 22.

A nine-strand woven wire fence was built to enclose the station premises after completion of field work in the fall. Split cedar posts, set 1 rod (5.0 m) apart and dug 3 feet (0.9 m) into the ground, were used for this 2-mile (3.2-km) fence.

An additional 10 acres (4 ha) of experimental plots were seeded in the fall to test varieties of winter wheat and fall rye. The tests included experiments on rates and dates of seeding. Portions of the timothy and brome fields established by Hiram Flewwelling were broken to prepare additional area for experimental plots the following year.

Cereal harvesting proceeded through September with the last of the root crops lifted in late October. The records taken for each cereal plot included yield, weight of straw produced, length and strength of straw, and nature and degree of damage due to rust, smut, and other plant diseases. Yields per acre ranged up to 34 bushels for spring wheat, 40 for oats, and 72 for barley (2.28, 1.53, and 3.87 tonnes/ha). Two-acre (0.8-ha) oat plots packed after seeding yielded 83 bushels per acre (3.17 tonnes/ha), 20% higher than the unpacked plots. Potato yields ranged up to 220 bushels per acre (14.8 tonnes/ha) with mangels and carrots yielding 32 and 26 tons per acre respectively (72 and 58 tonnes/ha).

The work accomplished by Mr. Hutton and his staff in a very short space of time would be judged by today's standard as nothing less than phenomenal. The major construction had been contracted but day labor for construction plus all the farm production activities had been provided by a small work force of five men. These were C. E. Craig (farm foreman), Seymour Edmunds, Robt. Hutchison and Dougal Jaffary (teamsters), and R. E. Everest, assistant to Mr. Hutton. Mrs. Hutchison was boardinghouse keeper.

Mr. Hutton recorded a relatively small volume of correspondence during 1907—approximately 400 letters were received—but he was in wide demand as a speaker. Business picked up in 1908. Correspondence increased fourfold, demands for public appearances tripled, 200 samples of seed grain and 166 of potatoes were distributed, and there were numerous requests for samples of soil inoculated for alfalfa. These soil samples, bagged in 100-pound (45-kg) lots, were available on request to any farmer within the area served by the station. At that time, this meant all of the province lying north of Calgary. There was no cost apart from freight.

Field crops

The area sown to varietal and other tests was doubled in 1908 with 167 varieties of cereal and root crops under test. Experiments to evaluate rates and dates of seeding were undertaken with all cereal crops, the soil packing experiment with oats was continued, a trial was conducted to compare yields of spring wheat sown on summerfallow, on fall-plowed timothy, or on bromegrass sod, and a number of plots of oats and barley were seeded on land fertilized at three rates with well-rotted barnyard manure. Forage crop research was expanded by seeding 12 varieties of grass and legumes in plots covering approximately 5 acres (2.0 ha).

Spring was early in 1908 and seeding of all crops was complete by 29 April. Growth was excellent; although some crops were damaged by early August frosts, Mr. Hutton was encouraged by the high yields obtained. One 1.5-acre (0.6-ha) plot of barley yielded 66 bushels per acre (3.56 tonnes/ha), an increase of 35% over the previous year, and similar improvements in yield over 1907 were recorded for oats and spring wheat.

Mr. Hutton's report for 1908 described results from what must have been a pioneer attempt to control weeds by means of chemical sprays.

*"Having had some difficulty in controlling Ball Mustard (*Neslia paniculata *L.) and having read of the success of Prof. Bailey of North Dakota Experimental Station in controlling this weed, an experiment was conducted with iron and copper sulphates applied by hand sprayer."*

The sprays destroyed the weed but this benefit was offset by damage to the grain crop. Mr. Hutton concluded that the technique was not ready for practical use and he did not continue this line of experimentation.

Construction during the year included another mile (1.6 km) of woven wire fencing and a substantial building to provide space for a granary, engine room, workroom, and museum. Its dimensions were 40 × 30 × 18 feet (12.2 × 9.1 × 5.5 m) with a 7-foot (2.1-m) basement. That the building is still in use and today is called the cereal building (No. 18) testifies to the quality of construction.

A new experimental technique, the use of replication, was introduced by Mr. Hutton in 1909. This technique, applied to tests with 29 varieties of root crops, was adopted in 1910 as a standard practice with cereals and forage crop work.

Mr. Hutton was a great proponent of manure as fertilizer. The small livestock population on the station was inadequate to provide the manure required for field experiments but he corrected this deficiency by assigning Seymour Edmunds the task of negotiating supplies from local livestock producers. As one of the old-timers recalls: "As a kid I was so glad to see Mr. Edmunds come around because his visit always relieved me of the chore of manure removal." But Mr. Hutton did not neglect the potential of artificial fertilizers. In 1909, he laid out numerous experimental plots with potatoes and spring wheat to test their responses to various fertilizers including nitrite, muriate of potash, superphosphate of lime, and basic slag. Increases in yield resulted from some of these trials but Mr. Hutton, noting that the benefits were insufficient to pay the cost of the fertilizer, delayed judgment until there was an opportunity to study residual effects on succeeding crops.

Studies of crop rotations were initiated in 1910. Plots totaling approximately 80 acres (32.4 ha) were laid out in rotations ranging from continuous cropping of oats "without rest or manuring" to a 7-year rotation that involved 5 years of alfalfa, 1 year of winter wheat, and 1 year of a mixture of oats and barley. With this project, Mr. Hutton anticipated future plans of the experimental farms system; his rotations preceded by 1 year the decision made at Ottawa to initiate studies on this topic at four other western locations.

Singularly detailed records of production costs and returns were kept for all rotations at Lacombe. Costs for horses, teamsters, manual labor, and each type of equipment employed were calculated from data entered in daily log books; land rental and material costs were recorded; and crop values were estimated from the production records for grain, straw, hay, and root crops appropriate to each rotation. These data were used to compute annual estimates of the net profit per acre.

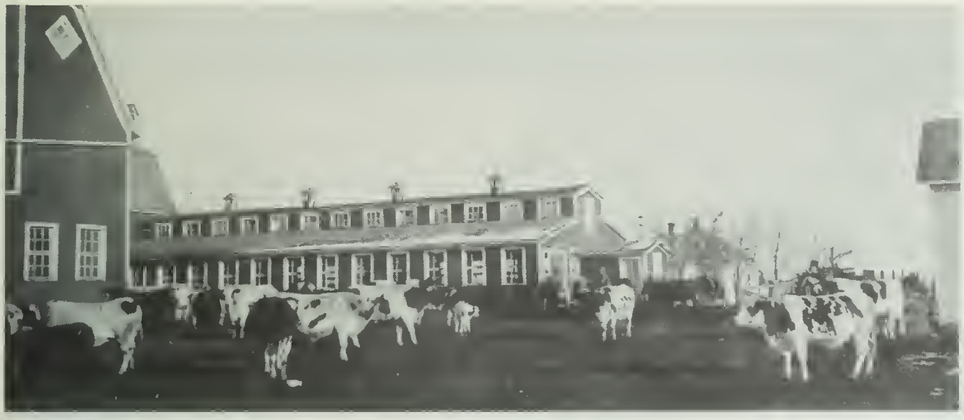
A series of 14 projects was begun in 1911 to compare various cultivation methods for summerfallowing and spring preparation of summerfallow and stubble land. The experiments, involving 454 plots, compared several depths and times for summer plowing, method and frequency of subsequent cultivation, fall versus spring cultivation of stubble land with and without burning off the stubble, and various times of soil packing following cultivation.

Plot size for varietal and other trials was increased from 1/60 to 1/40 acre (70 to 100 m^2) in 1911. With this increase, and the large new projects on rotations and cultural methods, all the original quarter-section except the building site was under intensive experimental use and the time had come to consider purchase of additional land.

Expansion

Negotiations were begun for two adjacent farms, both of which had large areas under cultivation. Their purchase, authorized in March 1912, increased the size of the station by 380 acres (154 ha) and provided the pasture and hayland required for initiating livestock research. Three substantial buildings were erected that same year: a cattle barn to house 100 head of mature stock, a dairy building to accommodate the manufacturing of butter and cheese, and a six-room house for the herdsman. The dairy building provided an engine room, manufacturing room, cold storage room, and an office on the main floor, with three bedrooms and a bathroom on the second floor. A small lean-to building housed a deep well, pump, and storage tank to provide running water to the dairy and barn. Construction also included an icehouse with a capacity of 80 tons (72.6 tonnes) and numerous small buildings and colony houses for poultry. The total cost of all construction that year was $11 790.

The office remained in the Superintendent's residence until 1914 when a separate building was constructed on the site of the present office building. This building, later converted to a dwelling, is now building No. 3. Additional construction in 1915 included a piggery (building No. 25) and



opposite page
The buildings in early 1913, viewed from the northeastern entrance. From left to right are the boardinghouse (1907); herdsman's house, dairy building, icehouse, and cattle barn (1912); the horse barn and implement shed (1907); cereal building (1908); and Superintendent's residence (1907).

above
Holstein and Angus herd about 1916. Note "monitor" style of roof on the dairy wing of the cattle barn.

below
Looking east in 1915 from the cereal building. Superintendent's residence at left and new office constructed in 1914 at right. Note the extensive landscaping.

several outbuildings. The first vertical silo was built in 1917 adjacent to the dairy barn.

Livestock

Dairy and beef Two grade Jersey cows were purchased in 1907 to provide milk for the staff. In 1910, Mr. Hutton was judge of the swine and dairy classes at the Calgary Exhibition and was impressed by two purebred Jersey heifers exhibited by B. H. Bull of Brampton, Ont. After placing them first and second in their class, he purchased them as the foundation for a herd at Lacombe. Authorization was given in 1912 to establish herds of both beef and dairy cattle and the purchases included 19 registered Aberdeen Angus females and the herd sire Elm Park Ringleader 7th -2861-, 16 registered Holstein-Friesian females headed by the bull Royalton Korndyke Count (88884), and 17 grade dairy females of Ayrshire, Holstein, and Shorthorn breeding. Fifty steers were purchased in the fall for winter feeding trials.

All dairy heifers were entered on the official Record of Performance test at their first freshening. Included in the performance test were the grade Holstein heifers which had been bred to selected purebred sires in the first step of a progressive grading-up experiment. This was to demonstrate the advantage of "good blood" in herd improvement. All remaining females were placed on feeding trials. With only 20 cows available for these trials it was necessary to conduct a "progressive" test, each ration being tested for a 2-week period with data on feed consumption and production for the first 7-day period being recorded but not used in analysis. Judged by today's standards this experimental design would be considered rather crude, but at that time it was a progressive innovation to get maximum information from limited resources.

Dairy manufacturing also began in 1913 with three main products, cream cheese, butter, and Coulommier cheese. The results from trial sales of the cheese products in Calgary and Edmonton encouraged two large dairies of those cities to undertake their manufacture. Having served the intended purpose of developing economically viable alternatives to cream and butter, the station turned its attention to the manufacture of Cheddar cheese. Through these years, a special attraction of the annual midsummer excursions, which brought more than 1000 visitors to the station for a single day, was the sale of cheese products from the dairy.

The beef breeding herd, like the dairy herd, was used for demonstration of the value of purebred sires in grading up, and a commercial grade herd was developed. Both the purebreds and the grades were used in various feeding trials, with costs of maintenance and production carefully recorded. Each fall thereafter, at least 50 head of steers were purchased for specific winter-feeding studies.

Horses Beginning in 1907, detailed records were kept of the hours worked by each horse together with the costs of feed and labor for maintenance and rearing of replacement stock. According to Mr. Hutton's reports of 1909 and 1910, each heavy draft horse worked 3200 to 3300 hours per year at a feed cost that averaged 90 cents per month. A similar cost was recorded in 1913. Costs were kept low by outside wintering of all but one work team and by the low price of the principal feed, oats.

The increase in land area of 1912 necessitated additional power, and 10 purebred mares, six Percherons and four Clydesdales, were purchased. Five of these mares foaled late that summer, but four of the foals succumbed to "navel ill" or "joint ill." This was not the only difficulty in rearing foals; the Superintendent's report for 1914 stated that one foal was killed by a timber wolf. The health problem was never fully resolved, despite a project undertaken to identify appropriate control procedures, but numbers increased until by 1917 there were 27 head, including two Hackney mares.

The Hackneys served a specific purpose; they powered the buggy used for travel to town for mail and supplies and for general transportation around the station. Mr. Hutton enjoyed a fast ride behind a high-stepping horse and these two Hackneys were the envy of many in the district. In midsummer 1917, "G. H." got his first car, a four-cylinder Dodge. A letter received in 1968 from Mr. J. E. Meagher, pig herdsman in 1917, describes that event. He wrote to say:

"Four cylinders were enough. G. H. was like the modern kids. He tried to drive at 100 mph before he learned to drive at 5. At that time no license was required and there was no speed limit except that set by the ability of the car to go places. I only rode with him once. Four days later most of my hair was again lying flat on my head."

Poultry Work with poultry began in 1912 with four breeds of chickens—Barred Rocks, Buff Orpingtons, Rhode Island Reds, and White Wyandottes—together with flocks of Bronze turkeys and Toulouse geese. Mating pens were established in the eight colony houses erected in March of that year and incubation and rearing were under natural conditions. Two poultry houses, each with a capacity of 100 layers, were constructed. One was a frame building and the other had walls of straw bales with a sectional frame roof for easy removal. A log house, built prior to 1897 as a dwelling, was moved to the site and renovated for use as a third poultry house. These three buildings were equipped with cotton fronts. Other buildings constructed included an administration building 18 × 24 feet (5.5 × 7.2 m) with office, feed room, storage, and a cellar to house the incubator (now building No. 30), a brooder house with a Simplex brooder installed, and 12 A-frame brooder houses.

The first poultry investigations, a comparison of these three types of buildings in terms of their potential to maintain high winter egg production and high hatchability of eggs, were begun in 1914. A custom hatching service was also provided to area farmers, who paid $5 per 100 eggs delivered for incubation. In addition, surplus chicks from the flock at the station were available at $20 per hundred. A small flock of Peking ducks was added in the spring and the total breeding flock housed that fall included 22 ducks, 266 hens, 9 geese, and 16 turkeys. Surplus stock and eggs for hatching were sold for breeding.

For the 1914 hatching season, a Candee incubator of 1200-egg capacity was purchased for comparison with the original Cypher machines, each with a capacity of 140 eggs. The Candee gave superior hatching percentage and the net fuel cost (nut coal) per 100 eggs hatched was 35c, compared with $2.09 for the old oil-fired Cyphers. Although the cost difference proved much less dramatic in following years, the small Cyphers were eventually discarded in favor of the large-capacity Candee.

Sale of breeding stock of all poultry species continued through 1914 and a supply of hatching eggs from the Barred Rocks and White Wyandottes was delivered to Lethbridge to launch poultry work at that station.

Trap nests were constructed and placed in use in 1915. This required individual wing banding of the laying flock. Mr. Hutton reasoned that egg records were as important for culling and selection of poultry as was the weighing and testing of milk to the dairyman. Breed comparisons based on these individual records, plus results from various poultry fattening experiments, led to his decision in 1916 to discard the Buff Orpington breed. Turkeys did not prove successful; they were afflicted each year with blackhead and were discontinued in 1918. Predation by foxes was a continuing problem with ducks, which were left free to utilize the small slough in one corner of the 15-acre (6-ha) poultry plant area. However, a small flock of ducks and two breeds of geese were maintained until 1922.

One interesting innovation in 1918 was the installation of electric lights in the poultry houses. Results obtained that winter showed that a substantial increase in egg production could be secured by artificial control of day length. The increase returned several-fold the costs of installation and electricity.

Sheep Twenty grade ewes and a purebred Shropshire ram were purchased in the fall of 1913 to initiate a grading-up experiment. Natural increase brought the numbers to 53 head in 1917, and value of the wool that year was double the price paid for the original flock. Late in 1917 a more ambitious breeding project was launched. Four hundred range ewes were purchased and divided into six flocks to compare the relative merits of different sire breeds for grading-up purposes. The sire breeds chosen were Shropshire, Hampshire, Leicester, Cheviot, Oxford, and Corriedale. The latter was purchased from New Zealand where it stood first in its class at the Rangiora exhibition.

The flock reached maximum size, 838 head, in 1920. During the winter they were held in open yards at the station but summer range involved a 4-day trek to pasture some 30 miles (48 km) away. The move to range was made shortly after lambing in the spring and the return trip just prior to snowfall in the autumn.

Swine A start was made on a swine herd in 1912 with transfer from Ottawa of five bred females, four Yorkshire and one Berkshire. Later that year the purebred Yorkshire boar Summerhill Gentleman 5th -39206- was purchased.

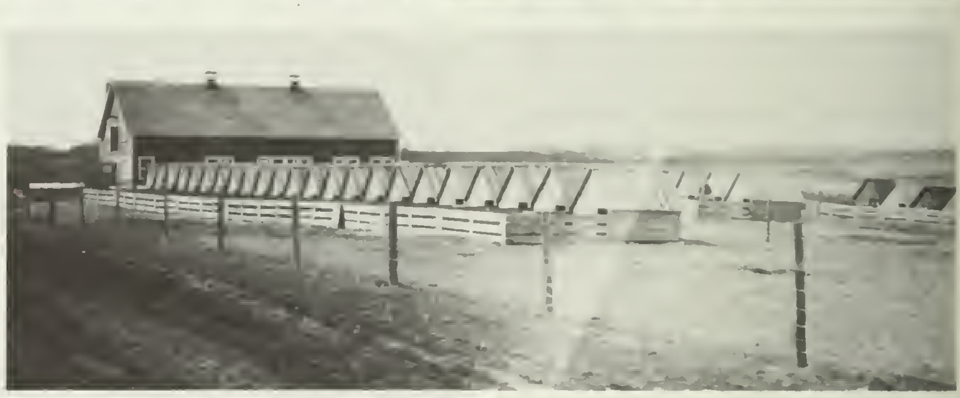
The initial five sows spent the winter of 1912–1913 in A-frame houses covered with straw to serve as insulation. These served for farrowing, and as housing for

opposite page
Field day about 1916; products from the dairy manufacturing department were offered for sale from the tent.

above
The first tractor in use for breaking newly cleared land about 1915.

below
Poultry plant in 1914, viewed over a portion of the cereal plots.

above
Sheep flock leaving for summer range in 1923. station residence, built in 1920 for George DeLong, in background.



below
Swine housing in 1917 farrowing house constructed in 1915 with sows and litters housed in A-frame cabins.

weaned pigs on feeding trials to compare the feeding value of barley and wheat shorts, both with and without the skim milk provided by the dairy operation. By 1915 the breeding herd had increased to 31 sows and a substantial increase in facilities was required. That summer a piggery with 10 farrowing pens, feed room, workroom, feed cooker, platform scale, and loft storage for grain and bedding was constructed (now building No. 25). The cost of this new farrowing accommodation was approximately $200 per sow as compared with $13 for construction of each A-frame cabin.

With the new facility in place, a series of experiments was initiated to compare pasture with confinement rearing of market pigs. A total of 50 growing pigs was entered on these experiments in 1915, and work was expanded in 1916 to examine the feeding value of sweet whey from the station dairy, self- versus hand-feeding of market pigs, and rations of frosted wheat, oats, or barley. Addition of the Duroc Jersey breed in 1917 brought herd strength to 116 sows, with more than 800 pigs used for feeding experiments.

The scale of operations is best described in the words of Mr. J. E. Meagher, who was swine herdsman that year:

"That was the year Mr. Hutton tried to conduct the largest breed test ever carried out in Canada. It didn't prove anything except that there were individual variations within a breed greater than those between breeds. Yorks, Berks, and Durocs were involved and we had 100 of each in three separate pens south of the lake. The Durocs watered in the lake, the other two breeds got their water out of barrels with waterers attached. I carried that water in pails from that lake twice a day and believe me they drank plenty

The pasture was timothy with alsike clover underneath. The pigs could not or would not keep up to the pasture so we turned a flock of sheep in. That didn't work, the sheep ate the clover down close to the ground and left the tall dry timothy standing."

The data obtained were not subjected to statistical treatment. Indeed, almost 30 years would pass before statistical analyses came to be part of animal experimentation. But Mr. Hutton recognized the fallibility of single experiments and all livestock experiments were replicated over several consecutive years. His annual reports recorded results obtained during the year, but information released to the general public was restricted to experiments that gave consistent results over at least three trials. Much of the information contained in the 1940 publication *Swine Production* by H. E. Wilson was derived from the careful work performed under Mr. Hutton's direction.

Apiculture The year 1912 was one of considerable reorganization of the Experimental Farms Service. Among the changes was creation of several new divisions of work, including the specialty of apiculture. Experiments in bee breeding and winter housing, undertaken at Ottawa that year, were extended in 1913 to two western stations, Brandon and Lacombe. Summer honey production was recorded but the main work centered on the cost and success of different methods for wintering the bees.

No colonies survived the first winter at Lacombe; the root cellar provided for storage proved too damp. Quarters in the basement of the new office building (built in 1914) were more suitable and by 1918 there were seven colonies to place for summer honey production. Some of these were used for studies of the climatic influence on honey production. Hives were weighed daily and changes in weight related to minimum and maximum air temperature, wind velocity and direction, hours of sunshine, precipitation, and availability of flowers for nectar. Others were left unmolested to provide estimates of total honey production.

From this early work it was concluded that bees could provide a profitable sideline to farming operations—yields up to 120 pounds (54.5 kg) were recorded for a single hive—and that overwintering of hives was both feasible and economically viable.

Horticulture

Tests of garden crops, flowers, and orchard stocks had a modest beginning in 1907 but the main concern was to establish an orchard and plant several thousand seedling trees for nursery stock. These efforts were expanded in 1908 and an arboretum was established with 193 species representing 56 genera. The following year 4 miles (6.4 km) of ash and Manitoba maple were planted around the boundaries of the farm. Large numbers of four species of shrubs were also planted around the perimeter of the generous building site and along the three main driveways, together with Colorado spruce and pine trees. All plantings were duplicated in 1910. Detailed landscaping of the premises was begun in the spring of 1912. Seymour Edmunds recalled the procedure: Dr. Saunders drove his buggy loaded with stakes around the stubble field (the area had been oat plots the previous year) and at each spot he indicated with his buggy whip, Seymour would place a stake color-coded to identify the tree or shrub to be planted. Many trees and shrubs planted that spring are still standing today.

Small fruits planted in 1907 bore their first fruit in 1909. The annual report of that year recorded heavy yields of strawberries, with fruit from the variety Senator Dunlap reaching 7½ inches (19 cm) in circumference. Some apple trees bloomed in 1911 but not until 1913 were yields recorded. By 1914 the orchard comprised more than 6000 apples, 59 varieties of currants, and 8 varieties of raspberries. Of the latter, the best had an average yield of 4974 pounds per acre (5.59 tonnes/ha) over the previous 4 years.

Vegetable trials expanded steadily. By 1913 there were test plots of 162 varieties representing 20 species that included tomatoes, squash, cucumbers, muskmelons, and pumpkins. The prize pumpkin weighed 18 pounds (8.2 kg).

The annual flower garden was not neglected. Trials of 131 varieties of 41 species were conducted in 1913, along with a special trial of sweet peas. Records for all annuals included date of planting, date of first bloom, and the vigor, duration, and quality of bloom. The same information, along with winterhardiness, was recorded for perennial plants and bulbs. The first planting of tulips, narcissus, daffodils, and crocus in 1907 was augmented annually, with the largest single planting, 4400 new bulbs, made in 1913. Also planted that year were 21 varieties of peonies imported from A. Dessert, of Chenonceaux, France, along with 26 varieties of perennial flowers and 17 varieties of canna lilies obtained from Ottawa.

Landscaping of the grounds was completed in the spring of 1914. Clumps of trees and shrubs now graced the area between the buildings and the Calgary–Edmonton trail and numerous flower borders, both perennial and annual, had been developed. The annual report for the year made special mention of the demonstrational hedges begun two years earlier. Of the 28 hedges planted, those considered of greatest promise were native white spruce, laurel-leaved willow, *Caragana arborescens*, and *Salix daphnoides acutifolia*. The caragana hedge was subsequently removed but several of the others can still be seen on the site where they were planted 70 years ago.

above
A view in 1917 towards the town from the roof of the Superintendent's house. Several of the experimental hedges, planted before 1917 (foreground), are still in place in 1982.

opposite page
In 1909, Mr. Hutton started an educational display at the Edmonton summer fair. In the final year (1917) approximately 25 000 people visited the traveling displays presented at 16 locations throughout central and eastern Alberta.

The beauty of the grounds, the extensive arboretum, the brilliance and variety of flowers from the tulips of early spring to the last annuals blooming in the fall, and the orchard plantations ranging from strawberries to fruit trees attracted a continuous stream of visitors through the summer months. Attendance records were kept only for the mid-July train excursions which began in 1909. These excursions, with advertising and reduced fares provided by the provincial Department of Agriculture, attracted more than 700 visitors in the first year and in excess of 1200 each year thereafter until they were discontinued in 1917. In addition to observing the results from experiments with varieties, rates and dates of seeding, row spacing, and fertilizer trials, the visitors were able to carry away many ideas to beautify their farmsteads and increase the productivity of crops and gardens. One indication of the impression created by the landscaping is provided by the requests for trees. In two years, 1909 and 1910, approximately one-quarter million Manitoba maple and caragana seedlings were distributed from the station. Seed grain and potatoes were in heavy demand and in 1911 the number of seed potato samples distributed (1009) was greater than the combined total from all the other farms and stations in the Prairie Provinces.

Extension

Mr. Hutton's many innovations in agricultural research, among them the use of the soil packer, herbicides, commercial fertilizers, and plot replication, exemplified the leadership he provided to Western agriculture. He had an enquiring mind and these innovations stemmed from critical reading of all the literature available on agricultural science. The first example of his innovative approach was his use of the soil packer.

Convinced that firm soil was essential to proper germination of seed, he laid out the first Canadian trials to compare crop production from packed versus unpacked soil. This American implement was new to Western Canada, and knowledge of its use at Lacombe in 1907 prompted the Alberta Department of Agriculture to invite Professor Campbell to tour the province and explain the use of the equipment he had designed. Viewed from the vantage point of 1982, this particular experiment may appear elementary; firmness of the seed bed is now recognized as essential. But despite the benefits demonstrated by Mr. Hutton's early work, the official position taken by the Experimental Farms Service as late as 1924 was that "results of tests show little difference between packed and unpacked soil."

Mr. Hutton also led the way in extending the results of experiments to the farming public. In his first year at Lacombe, he judged several seed fairs, was guest lecturer at several meetings of the Farmers' Institute, and became involved in affairs of the Alberta Fairs Association. These activities were expanded in 1908 and that year also marked the inauguration of a Provincial Livestock Judging School—Mr. Hutton was instructor at all the locations visited—and a 2-week Agricultural Short Course. The latter, the first of its kind in Western Canada, was promoted by Mr. Hutton through the Lacombe Board of Trade and was hosted by the Lacombe station; Mr. Hutton was the principal lecturer. In 1909, Mr. Hutton initiated an educational display at the Edmonton Exhibition. A tent erected on the fairgrounds housed exhibits of crop materials with various charts showing experimental results. This extension activity was expanded in 1910 to include the Calgary Exhibition and thereafter, in response to public interest, further expanded to include regional fairs throughout Alberta. In 1917, the last year of this activity, approximately 25 000 people visited the station's exhibits presented at 16 centers throughout the province.

By 1909 Mr. Hutton had become recognized as an outstanding judge of seed, standing crops, horticultural exhibits, Good Farming competitions, and livestock, and his services as a judge, lecturer, and convention speaker were in high demand. These engagements were not limited to Alberta; during the years 1912–1918 he served as judge for market and breeding classes of dairy and beef cattle, sheep, and swine at many regional and national exhibitions held in Calgary, Edmonton, Regina, Brandon, and Winnipeg. In addition, he addressed numerous national meetings including the National Forestry Convention, Canadian Seed Growers, Canadian Horticulturists, National Livestock Conference, Holstein-Friesian Association, and the Canadian Exhibition Association. He also served as a Canadian delegate to international meetings such as the 1913 Dry Farming Congress held in Tulsa, Oklahoma.

Despite all of these engagements, Mr. Hutton continued to give personal supervision to an ever-expanding research program at Lacombe. In 1912 he coauthored, with Mr. Fairfield of the Lethbridge station, a publication entitled *Alfalfa Growing in Alberta*. The following year he authored a departmental publication, *Feeding for Beef in Alberta*, and prepared a detailed description of horticultural crops entitled *Best Varieties of Fruits, Vegetables, Useful and Ornamental Trees and Shrubs, Herbaceous Perennials, Climbers and Annuals for the Prairie Provinces*. His next publications were *Grading Up the Dairy Herd* and *Food Stuff Available to Alberta Dairymen*. All these publications, together with his detailed annual reports featuring separate sections for each line of work, were well received by the farming public and did much to broaden the influence of the station.

Staff

No small part of these early successes was due to the capable staff recruited by Mr. Hutton. His foreman for the first 2 years was Mr. C. E. Craig, who left in 1909 to become manager of a fruit farm in British Columbia. R. E. Everest, a graduate from the University of Manitoba, assumed the foreman's responsibilities until Seymour Edmunds was appointed in 1911. Seymour, one of the original employees at Lacombe, served as farm foreman for 40 years before retirement in 1951. The only break in this long career was during World War I when he served overseas with the Canadian infantry. During his absence the acting foreman was Bob Rhind who also served as livestock herdsman. Frank Lewis (1913), A. Struthers (1914–1916), and E. Phillips (1917–1918), an ordained Baptist minister, worked with poultry. F. W. Jones was the shepherd and George Kiddie and James Meagher were among those who worked with pigs. E. H. Mills was in charge of the dairy and Jessie Grant, the first woman employed at the station, was dairymaid in 1913 and 1914. She was succeeded by Miss K. Ingram in 1915. S. Brooks (1901), E. C. Whiffen (1913), J. A. Horn (1911), Joe Shaw (1916), N. Ofledahl (1913), D. N. McCrady (1916), and J. McCutcheon (1918) were among the gardeners, plotmen, and teamsters on staff for 3 years or more during this period.

Many of these employees enlisted for service in World War I but, unlike many other stations, Lacombe did not diminish the tempo of research and extension activity. The substantial programs with field and horticultural crops continued. Livestock and poultry populations expanded, with emphasis on grading-up and nutritional trials with dairy cattle; nutritional and housing experiments with pigs, poultry, and beef cattle; and a variety of studies in apiculture. A few pigs, beef cattle, and poultry were also sold for breeding purposes. Extension activities were not curtailed until 1918, but shortage of farm labor that year did result in suspension of varietal tests with turnips, mangels, and other root crops used specifically for livestock feeding.

Gladstone George Hall Hutton, first Superintendent, addressing the audience of the second annual midsummer excursion. View is to the northeast with horse barn at left, a temporary shelter in the center, and Superintendent's residence at right. Mr. Hutton considered the turnout of 800 somewhat disappointing.

There was no office staff in the first years and all typing was done at a flat rate of 10¢ per page by Miss Boyd (1907–1908) and Miss Vickers (1909). L. C. Long, employed as a typist-clerk in 1910, enlisted in 1914. Subsequently this position was filled by W. Middleton in 1914, Miss K. Ingram who transferred from Ottawa in 1915 and Miss M. Wyld (later Mrs. Dick) from 1915 to 1918.

R. E. Everest left in 1911 to become Superintendent of the new Experimental Station at Scott, Sask. The agricultural graduates who followed him in the livestock work were R. S. Kennedy (1913), Harold Hicks (1914) who later became Superintendent at Agassiz, W. H. Gibson (1914–1915) who later became Superintendent at Indian Head, and B. C. Milne (1915–1919). Norman A. Clark was in charge of plant breeding work in 1917. He returned to university studies in 1918 and later rose to a prominent position with the United States Department of Agriculture. Plot foreman in 1917–1918 was N. T. Bell, then a student at the University of Alberta. He was followed by John Horn who later accepted the position of plot foreman at the Indian Head station.

Early in 1919, Mr. Hutton resigned to accept the position of Superintendent of the Immigration and Colonization Branch of the Canadian Pacific Railway. Part of his new duties included responsibility for the CPR demonstrational dairy farm at Strathmore, Alta. B. C. Milne, B.S.A. graduate from Guelph, became acting Superintendent at that time. Mr. Hutton had a high regard for his capabilities. During the previous 3 years he had shared with Milne the responsibility for directing the program, writing reports, and extending results of research to the Alberta farming community. Milne was well respected by the staff and the community and all looked forward to his confirmation as Superintendent.

This was not to be. There were others who aspired to this post at Lacombe and Mr. Milne's application was placed on hold. Discouraged by the indecision, he resigned after 18 months and Mr. Francis Henry Reed was appointed as Superintendent in September 1920.

* * *

CHAPTER 5

The Next Quarter-century, 1920 to 1945

Mr. George Earl DeLong was the first assistant appointed after Mr. Reed became Superintendent. A 1919 graduate from the Ontario Agricultural College, Mr. DeLong came to Lacombe in late 1920 to take charge of work with field crops. Shortly thereafter, Cecil R. Bradford was appointed in charge of livestock work. He resigned after 7 months. His replacement, Lyman T. Chapman, stayed 19 months then accepted an editorial post with the *Family Herald*. Later he was to join the staff of the Nova Scotia Agricultural College at Truro. He was succeeded by H. E. "Happy" Wilson in 1926.

Two dwellings were constructed in 1920, one for Seymour Edmunds, the farm foreman, and one for Mr. DeLong. The latter, now building No. 21, has continued in use as a dwelling. In 1921, the horse barn and implement shed were relocated and remodeled and a new horse barn was constructed in 1924 (building No. 11).

Mr. Reed had two interests, the show ring and horses, and his preoccupation with these activities was to have a profound influence on the direction taken by the station during his superintendency.

Field crops, cereals, and horticulture

The practice of plot replication introduced by Mr. Hutton in 1908 was continued by Mr. DeLong. All varietal tests were seeded in duplicate 1⁄40-acre (100-m^2) plots in 1921. Cereal tests included a large number of new selections from Ottawa and several new crops, including flax, buckwheat, and sweetclover, were introduced to the testing program. The same year he began selection work with sunflowers in cooperation with the Division of Forage Crops, Central Experimental Farm. This crop had been introduced by Mr. Hutton for silage production but the tall-growing, late-maturing, single-stem varieties available were difficult to handle and the large heads tended to block the rollers of the cutting box. However, each variety possessed considerable variability and George DeLong was optimistic that shorter, multibranched strains of earlier maturity could be selected. He also hoped to develop strains resistant to wilt disease.

Breeding work with other crops, begun in 1922, produced 770 selections of wheat, oats, barley, and peas for testing in 1924. There were also 150 increase plots for selections of these crops made the previous year and 140 varieties were tested in duplicate plots. Testing in quadruplicate rod-row plots began with root crops in 1925 and a new varietal testing procedure was introduced for cereals. Varieties of wheat, oats, and barley to be compared were seeded in small plots, each consisting of five rod-rows (rows 5 m long) of which the three central rows were harvested, and yields recorded in grams. That appears to be the earliest record of the use of metric measure in the crop testing work of the Experimental Farms Service! Methods of seeding were standardized: for each variety, the same number of kernels was planted. Each variety was represented by a minimum of three replicates, but varieties considered most important were replicated eight times. This testing procedure resulted in the seeding of more than 4000 rod-rows in 1929. In addition, approximately 4000 pure-line selections of wheat, oats, and barley were grown in head-row plots.

above
View east in 1930 from the horse barn across the garden plots to the office, built in 1914 and expanded during the late 1920s.

Harvesting sweetclover plots with the scythe in the mid-1920s.

The plot gang in 1928. Standing (L to R), Fred Walker, Lin Bolton, George DeLong, Campbell (Tom) McBeath, and Charlie Duthie. Kneeling (L to R), Herb Carruthers, Fred Stewart, Joe Lahiff, and Jock Thompson.

Cereal work that year also included 151 varieties grown in nursery plots for demonstrational purposes and a large number of "verification" trials conducted for the Canadian Seed Growers' Association. For these trials, first described in the 1928 report, seed samples submitted by registered and Elite seed growers of the province were grown for validation of "purity" of type, and standing crops were reviewed at annual field days held each August. These tests continued for more than two decades.

Tests with root crops, reinstated in 1921, continued until the late 1920s. At that time they were discontinued and the forage crop work expanded. By 1930 a forage crop nursery of more than 2000 plots was in place and Mr. DeLong prepared a bulletin titled *The Production of Cheaper and Better Forage Crops for Central Alberta*. He included results from varietal tests as well as experimental information on methods of seeding, cultural methods, grass–legume mixtures, rotations, times of harvesting, and winterhardiness. By 1931, some 240 varieties of perennial grasses and legumes were under test along with

80 annual forages that included 13 species of legumes. In view of the present-day concern about breeders' rights, it is of interest to note that two of the alfalfa varieties introduced for test at Lacombe in 1925 were developed by Paramount Seed Farm of Alberta.

Breeding work with horticultural crops was not neglected. In 1926, the best seven of the 30 tomato varieties under test included five Lacombe selections. Also, 10 of the 20 garden pea varieties, including two of the three top performers, were Lacombe crosses or selections. That same year, mention was made of a vigorous fine-fruited strawberry, the Lacombe. This was one of many seedlings that had been produced in a selection program at the station.

The crop rotations laid down in 1910 continued unchanged until 1922. That year Mr. DeLong compared their lifetime performance and concluded that continuous grain cropping had given the highest returns per unit area, followed closely by the grain–grain–summerfallow rotation. Least profitable were the long-term rotations involving pasture and hay crops. Mr. DeLong was guarded in his conclusions. He noted the importance of the economic climate, in that the relative values of the different crops produced varied from year to year. He identified wheat as the superior cash crop, considerably better than barley during those years, but added the proviso that earlier-seeding and earlier-maturing barley varieties might change that picture. He also observed that continuous cereal cropping was accompanied by a gradual buildup of weed problems. Based on these observations, he modified the cropping sequence of some of the original rotations and initiated seven new rotations in 1923.

At the same time he updated the cultural experiments begun in 1911. The data from the original 454 plots involving 14 separate projects had given valuable information on a variety of cultural methods. Fall discing immediately after the binder proved superior to fall plowing for weed control and a plowing depth of 4 inches (10 cm) proved optimum for both breaking of sod and summerfallow. Burning of stubble as a method for weed control resulted in slight increases in yields but Mr. DeLong observed in his 1922 report that "this practice cannot be recommended as it will materially deplete organic matter of the soil and will eventually result in soil drifting."

Following these analyses, a new series of cultural experiments was begun with particular emphasis on weed control procedures. These projects, involving 471 plots, considered the timing and sequence of tillage methods and included use of new equipment that had become available to the farming industry. Also included were investigations on the husbandry methods for establishing successful stands of biennial and perennial forage crops and the optimum stage for harvesting (by binder) the three cereal crops. The criteria for this phase of work were yield, percentage hull, commercial grade, and the milling quality of wheat.

Tests with artificial fertilizers were undertaken in 1929, the first such tests since Mr. Hutton's experiments during the period 1909–1916. Phosphate fertilizers gave the best results and fertilizer drilled in at the time of seeding resulted in vigorous crops that successfully competed with weeds; rates of 50 pounds per acre (56 kg/ha) were recommended for ammonium phosphate and superphosphate. Experiments with barnyard manure decreased. Reasons given were limited supplies and high labor costs, but it was also noted that manure, unless rotted for several years, was a source of weed infestation.

An average of eight seasonal employees comprised the "hoe gang" responsible for seeding, tending, and harvesting of the plots. Students from the University of Alberta or the Agricultural School at Olds generally predominated, and among those who subsequently attained wide recognition in their chosen field of agriculture were Tom McBeath (Consolidated Mining and Smelting), Jack Cram (*Family Herald*), Fred Bentley (University of Alberta), Ernie McWilliam (Winnipeg Grain Exchange), and Vic Jones (Swift Canadian Co.). Others who achieved distinction within the Experimental Farms Service were Don McFadden, Lin Bolton, Harry Leggett, and "Buck" Stelfox.

Tom McBeath was plot foreman after John Horn moved to Indian Head in 1924. When not engaged in hoeing crops, he and his gang tramped sunflower silage in the upright silo situated between the wings of the dairy barn. He recalls the Oil-Pull Rumley that powered the silage box, and the enormous weight of the sunflower bundles produced by a horse-drawn binder adapted to fit the 10-foot (3-m) stalks: two men were required to lift each bundle.

Don McFadden, cerealist, began work in the plot crew in 1929 and retired in 1971.

above left

The plot crew about 1930 (L to R) Herb Carruthers, Jim Shaw, Cal Fairbanks, D. S. Thompson, and Charlie Duthie

above right

Don McFadden and Cal Fairbanks with the plot seeder, 1930 vintage

below

The Angus show herd in 1924–1925

Charlie Duthie was the teamster responsible for all horse operations in the plots. He plowed the land, seeded the larger areas, and cultivated the row crops included in the rotation studies. He was a Scot and a bagpipe player. Many a parade or social gathering was enlivened by his skill with the pipes. And he was a central figure of the hoe-gang, for he provided the main continuity from one season to the next for this group of seasonal employees.

Lin Bolton followed Tom McBeath as plot foreman and Don McFadden, who joined the hoe gang in 1929, succeeded him in 1935. He held the position until entering the RCAF in 1941. Other members of the hoe gang were Harry Leggett (1936), Henry "Buck" Stelfox (1939), and Harvey Allen (1942). Harry, Buck, and Harvey also joined the RCAF, serving overseas before returning to employment at Lacombe. Buck received the DFC for gallantry in action.

John Walker, later Superintendent of the Indian Head Forestry Station, was in charge of horticulture during the latter part of Mr. Hutton's period. He was succeeded by Bill Berggren who later moved to Bowden, Alta., to establish Bowden Nurseries. This business flourished and has become one of the leading nurseries in central Alberta. During the summer months, Berggren was assisted by a grounds crew that included R. H. Dickson, a deaf-mute from Medicine Hat, who was a trained botanist and developed the first herbarium at the station. His collections were not augmented until after World War II.

Bill Berggren was succeeded by George McMillan Ramsay in July 1929. A graduate (in horticulture) of University College, Dundee, Scotland, and a decorated veteran of World War I, Ramsay directed experiments with all horticultural crops, supervised grounds maintenance, addressed meetings, and served as a judge at fairs and exhibitions. For these duties he received a salary of 33¢ per hour, about $988 per year. The first greenhouse, built in 1935, also came under his supervision.

In the early years of World War II, the British Commonwealth Air Training Scheme was searching for suitable sites to establish training fields. Western Canada was chosen; it had less cloud than alternative regions and the long hours of sunshine promised better flying weather. The Experimental Farms Service was asked to cooperate in locating sites that met specific requirements and to provide personnel to supervise development and maintenance of the runways.

George DeLong, because of his blend of experience in soils, cultural methods, and forage crop varieties, was assigned this task for central and northern Alberta. By the fall of 1941 there were 21 airfields under his supervision, and more, some of them outside Alberta, were added the following year. This work grew to occupy about half of his time. Initially this presented few problems to his program at the station since the plot work was capably handled by Don McFadden, appointed as a fulltime graduate assistant for work with cereals in 1940, and summer employees Harry Leggett and Buck Stelfox. But the departure of all three men for active service left a void that could not be filled and for the remainder of the conflict all field crops work was greatly curtailed.

Livestock

Prior to 1920, the extension efforts of the station centered on speaking engagements, exhibits of an educational nature at local and provincial fairs, and judging of livestock, seed exhibits, and horticultural entries at various shows. On only one occasion did the station provide a show ring entry. That was in 1919, when a crossbred steer was entered in the Calgary Winter Fair. He was named Reserve Champion of the show.

Mr. F. H. Reed was to change this thrust. He was a strong proponent of the show ring and in 1921 he decided that one class of stock would be featured annually by entry of major exhibits on the Alberta show circuit. A modest start was made that year by entry of 60 wethers and ewes in the Edmonton spring show and by a research project to demonstrate the cost of fitting bulls for show and sale. The latter continued for several years and large entries of sheep were featured annually at the Edmonton Spring Fair.

Pigs were the second class of stock chosen for exhibition, and in 1922 a herd of 39 animals, including one sow and litter, toured the Alberta summer show circuit. These, together with 75 pigs exhibited at the Calgary Winter Fair, gave a strong showing and the many ribbons earned included 34 first placings.

A show herd of 12 Aberdeen Angus was selected and fitted for show during the winter of 1923. Bill Jardine, herdsman for McGregor Farm in Manitoba (the owner, J. D. McGregor, later became Lieutenant Governor of Manitoba), was hired as showman for the herd and he spent 6 weeks on the road in the summer of 1924, earning impressive winnings at Calgary, Edmonton, and Red Deer.

Stimulated by these successes, the station abandoned the concept of featuring a single class of stock each year. Exhibits the next year included cattle, horses, sheep, and pigs. Bill Jardine fitted a new Angus show herd and its travels in 1925 covered six major shows that culminated in the Chicago International Livestock Exposition. Among the many awards received were Reserve Senior and Reserve Grand Championships for both bulls and heifers at Chicago. A show string of Clydesdale and Shire horses traveled the same circuit under the direction of Fred Jordon, who had accompanied the imported Shires to Canada. Although not formally employed, except as show handler of the horses, he spent most of his time at the station and worked closely with Bill Jardine in all show activities. Like the cattle, the horses earned many top awards. The sheep exhibits at Edmonton repeated their successes of previous years. Top awards were also received by four pigs entered in the first Alberta Bacon Breeders' competition held at the University of Alberta. More than 150 animals of four classes of stock traveled the show circuit in 1925.

Cattle The large resources required for this show ring activity detracted from the research effort. Dairy operations were discontinued in 1924, the entire breeding flock of sheep was dispersed that fall, feeding trials with beef cattle were suspended, and the pig and poultry populations recorded in 1926 were less than half of those recorded in the spring of 1920. Factors other than infatuation with the show ring undoubtedly contributed to this decline but the facts indicate that the vigorous animal populations and programs developed by the first superintendent were steadily e
the period 1920 to 1926."

But the worst was yet to come. Blood tests for Bangs disease (*Brucella abortus*) conducted on the Angus herd by the Health of Animals Branch in late 1928 revealed several positive reactors. There were six abortions the next spring and a second herd test revealed the presence of the infection in the Holstein herd. All exhibition activity ceased with this outbreak of infection, sale of breeding stock was discontinued except for young bulls that proved negative to tests, and the culling of infected animals reduced the Angus females by half and the Holsteins by 30%.

Then came the fall of 1931. The Superintendent had just departed for his annual excursion to the Royal Winter Fair when the health inspector arrived to conduct the annual blood test. Results were so dismaying that he ordered the immediate slaughter of the entire Angus herd and extensive culling of the Holsteins. As he was unable to contact Mr. Reed, it fell to his assistant, Mr. DeLong, to execute this fateful order. There is no record of Mr. Reed's reaction to the empty barns that greeted him on his return.

The source of infection for the disease outbreak was never determined, but there were strong suspicions that it originated with the traveling show herd as those animals were among the first reactors identified.

The Angus herd was not replaced. In its stead the Ottawa administration directed that Lacombe, situated in the heart of Shorthorn country, should be the site for a pedigree herd of that breed. Further, a new departmental policy that limited each farm and station to a single breed of cattle required disbanding of the Holstein herd; all animals that tested negative were shipped to the Lethbridge station to augment the herd created there in 1924 by the first transfer of cows from Lacombe. A herd of dual-purpose Shorthorns was assembled in 1932 with transfer to Lacombe of 40 females from two Saskatchewan locations, the Indian Head Experimental Farm and the Experimental Station at Swift Current. The herd sire was Brownvale Anchor (191163) bred by James Douglas and Sons, Caledonia, Ont. In 1934 the herd was augmented by purchase of five cows from an Alberta breeder, Wm. Hudson of Kathryn.

opposite page • above
Hauling ice for the dairy icehouse, a common scene from 1912 to 1925.

opposite page • center
Professor George Day judging Shorthorn bulls at a station field day in 1933.

opposite page • below
Work horses dressed for a field day parade in 1936.

left
Band of mares brought for breeding in 1926 to the Shire stallions stationed at Lacombe 1924–1929. This breeding service continued into the early 1950s.

The breeding stock was considered dual-purpose; hence the herd was entered on the Canadian Record of Performance test for purebred dairy cattle. This continued the testing program begun in 1913 with the Holstein herd. The last feeding experiment with cattle was conducted in 1933. After that date the herd was divided, with milk production measured only for females showing a strong milk flow early in their first lactation. The remaining females, designated as a beef herd, were maintained on pasture for calving and suckling. During the 12 years from 1933 to 1944 an average of eight lactation records were obtained annually.

The herd, tested annually for Bangs disease, remained free from the problem until 1944. In the herd test that year, 63% of the animals gave positive or suspicious reactions. No abortions were recorded until 2 years later when 44% of all gestations terminated with abortion. In the meantime, the station embarked on a program of calfhood vaccination using Strain 19 vaccine from the Animal Diseases Research Institute, Hull, Que.

Norman Brooks was the dairy cattle herdsman during the early 1920s, a period when the dairy operation at Lacombe was recognized as the largest in the experimental farms system. One of Norman's responsibilities, and no one else wanted it, was handling the herd sires. The two Holstein bulls, known to the staff as Ottawa and Midnight, were especially fierce. It was considered improper to dehorn purebred bulls in those days and this respect for the fancy points of breed type almost cost Norman's life. He was severely gored and his brother, Len, took over the herd while Norm recuperated. Several years later Len moved to Edmonton as Superintendent of the University Farm.

Horses Mr. Reed waxed eloquent on the topic of horses, and his first act on coming to Lacombe was to auction seven of the grade Clydesdale geldings, sell the remaining Percheron, and augment the stud with purebred Clydesdale mares. This left only four nonpedigreed animals. The following April (1923) he accepted a gift from the Shire Society of Great Britain of two stallions and three mares. The Society desired to promote the breed in Canada, and at Lacombe they were to be available for demonstration, exhibition, and breeding purposes.

The Shire mares lasted less than 18 months. They were recorded in foal in late 1923 but the single foal reared was the only female Shire entered on the year-end inventory of 1924. The stallions fared better. All Clydesdale mares on the station were bred to Shires for the next several years and the senior stallion, Marden Jupiter -1610-, served more than 200 mares brought to the station for breeding prior to his death in August 1925. In accordance with the proviso of the gift of these horses, Mr. Reed entered a stallion and a mare in numerous exhibitions during 1924. Both were awarded top placings at each show, culminating in Grand Championships at the Toronto Royal Winter Fair and the Chicago International Livestock Exposition.

Marden Jupiter was replaced by the Shire Snelston Topper (38528), a gift from Mrs. Stanton of Ashbourne, England. He stood for community service at Lacombe until 1929 and his disposal terminated the demonstration of this breed. The next stallion, purchased in 1930, was a purebred Clydesdale, His Majesty (24616). By 1936 all the horses at the station were registered Clydesdales. Frank Oxley was the stallion groom through the early years, Alex Pollock from 1931 to 1943, and Harry Churchill after 1943.

The original Hackneys were replaced but two driving horses were maintained for light delivery work. A familiar sight in Lacombe during this decade was John Wood, the groom and general handyman, driving the horse and buggy for mail service and pickup of supplies.

Horses served as the primary source of power throughout the years of Mr. Reed's superintendency. This was true of the entire farming community, and all colts surplus to the needs of the station found a ready market. In recognition of this demand, special efforts were made to secure top-quality stallions for the station. These stood for service to mares throughout Alberta. Service was free although a small boarding fee was charged for mares left at the station pending confirmation of pregnancy.

right
Team of Clydesdales with walking plow in early 1930s. Horses continued as a major source of farm power into the 1950s

opposite page
Viewing the stallion during an intermission in the 1931 cereal crops field day

In 1934 the federal government enacted a horse improvement policy known as "The Dominion Premium Mare Policy" to promote the use of stallions possessing exceptional merit. The first stallion to stand at Lacombe under the policy was a 2-year-old Clydesdale, Strathore James -26996-, imported from Scotland. As a yearling he had placed first in his class at the Royal Show in London. The four stallions that followed were of equivalent merit and 487 mares were bred under the provisions of the policy before it was discontinued in 1944.

Poultry There was little demand for breeding stock of the Buff Orpingtons and Rhode Island Reds and they were discontinued by 1922. Turkeys, ducks, and geese were reinstated for a brief period but they, along with the Barred Rock flock, were finally discontinued in 1925.

The White Wyandotte remained. This breed had responded well to selection for increased production—selection that utilized the wing banding and trap nesting procedures introduced by Mr. Hutton—and performed well on Record of Performance tests and in provincial egg laying contests. Indeed, during the 1930s the Lacombe entries stood above all other breed entries in these contests. In fertility, hatchability, and chick viability the Wyandottes had proved to be inferior to the other breeds at Lacombe, but this was compensated for by high egg production and the breed was popular among producers.

A number of experiments were conducted by Jack Groom, the poultryman, in search of ways to improve reproductive performance. No leads had been uncovered when he retired and his successor, H. J. (Jim) West, appointed in 1929, continued the investigations. A graduate in poultry from the Agricultural Institute, Sparsholt, England, and with 2 years' experience with Alberta Poultry Inspection Branch, Jim was well equipped for the years of work that followed.

Mr. West, with full approval from the Superintendent, proceeded methodically to re-examine all environmental factors that might influence fertility and hatchability. By 1939 he was convinced that genetics was involved, a conclusion based on the variation in reproductive performance he observed between the Lacombe flock and other strains of Wyandottes. He also observed strain differences in the frequency of the genes for fast-feathering. Subsequent breeding studies established that these two traits were not genetically associated and, after purifying the Lacombe strain for the fast-feathering allele, he initiated a project in cooperation with Summerland to investigate the possibility of genotype–environment interactions. Technical advice on experimental design was provided by Dr. S. S. Munro of Ottawa. The test, concluded in 1946, did not resolve the central question but detailed information obtained on the physiology of reproduction, and subsequently published by Dr. Munro and his colleague, Dr. Kozin, proved of considerable value in designing the definitive studies concluded in the following decade.

Swine Work with pigs continued along the lines developed by Mr. Hutton. There were nutritional trials, comparisons of indoor and outdoor housing for market hogs, and pasture studies. But underlying all these experiments was a strong thread of breed comparisons and an evaluation of various breed crosses.

In 1922, when carcass grading standards were introduced, there was considerable controversy as to the breed or type that would excel. Berkshires were favored by producers; they were considered easy to keep, they were resistant to sunscald, and in the words of most producers they "filled the eye to perfection." Yorkshires, by contrast, were known to be highly susceptible to sunscald under pasture conditions, they were considered poor grazers, and they always had a lean and hungry look.

Experiments were undertaken to evaluate these opinions. Gilts and boars were fed to market weight and breeds were compared under a variety of conditions of feeding and management. Carcasses were graded and judgments made in terms of economics. The Yorkshire proved superior to the other breeds in each of three consecutive years. Their feed costs proved lower and grading results were higher. The least efficient, and also the least popular, breed was the Duroc-Jersey and it was replaced in 1924 by the Tamworth.

In 1928 the Canadian Government initiated studies on the feasibility of a national swine testing procedure for selection of superior breeding stock patterned after the Danish progeny testing program. The Lacombe station assisted with the preliminary work and was designated as one of the official test stations when the national Advanced Registry program was launched in 1934. This program eventually grew into the present Record of Performance testing program for pigs.

One result of this work was the final evaluation of the Yorkshire, Tamworth, and Berkshire breeds. The reproductive superiority of the Yorkshire had been evident for many years, but it remained for the Advanced Registry program to conclusively demonstrate the breed's superiority in carcass and rate of gain. The Berkshire herd was disbanded in 1932 and the Tamworths followed in 1934. Tests with the Swedish Landrace, begun in 1935, were discontinued in 1940 after results indicated that the breed was not superior to the Yorkshire.

The first pig experiment conducted at the direct request of the packing industry was undertaken in 1934. The Swift Canadian Company was concerned that the exercise obtained by pigs fed on pasture resulted in excessive development of the shoulder. The experiment was designed to test this hypothesis and to examine differences in carcass proportions and measurements that might result from rations fed either indoors or outdoors. The results confirmed previous experiments. Confinement rearing and high-energy rations resulted in improved growth rate, but none of the treatments had any measurable effect on length of carcass or percentage of shoulder.

None of the crossbreeding work at Lacombe included studies of the reproductive performance of crossbred females. This omission was unfortunate, for it is now widely recognized that crossbred females, particularly among the white-skinned breeds, have superior reproduction. Many commercial producers were fully aware of this potential advantage and crossbreeding was popular among them. However, breeders of purebred stock referred to the practice as mongrelization, an attitude that had official government support through the purebred sire policy, and the experimental station could not act, or appear to act, in a way contrary to this policy. It was not until 1945 that a more enlightened attitude towards crossbreeding developed in Canada, and it was 1947 before the Experimental Farms Service took the first steps to explore the full advantages of hybrid vigor.

Meanwhile, a new thrust had been developed in pig breeding. The person responsible was Jack Stothart, then a scientist with the Central Experimental Farm at Ottawa. Recognizing the need for large populations in animal breeding research, Mr. Stothart requested permission to broaden his selection studies with pigs by inclusion of facilities at some of the Branch stations. When permission was granted in 1942, the first cooperative animal breeding research undertaken in Canada was launched and Lacombe became the first station designated in the cooperative network.

It would be many years before this cooperative breeding venture bore fruit, but Lacombe had already made its mark in pig breeding. Part of this came through the experimental results, first published in Happy Wilson's bulletin *Swine Production*, which led to the gradual increase in popularity of the Yorkshire breed. (By 1950 Yorkshires had come to represent 98% of the total swine registrations issued in Canada.) Part of it came through the breeding and sales program adopted by Mr. Reed and Mr. Wilson.

The herd at Lacombe was not large during the period 1920–1940, the sow inventory having decreased substantially from the peak of 116 head recorded in 1917. But this decrease had been partially offset by adoption of twice-a-year farrowing, a physical impossibility before enlargement of the farrowing facilities in 1935, and by concentration of efforts on the most prolific breed, the Yorkshire.

The apiary in 1930 In the background are the exhibition barns of the Lacombe Agricultural Association

Lacombe's reputation was high among pig producers and there was always a keen demand for stock from breeders across Canada. Demand frequently exceeded the supply—annual sales of more than 200 animals were recorded in some years—but neither Mr. Reed nor Mr. Wilson could have envisioned the impact the Lacombe program would have on the Canadian swine industry. Indeed, this did not become apparent until long after the fact. In 1960 an analysis by Fredeen of the breed structure of the Canadian Yorkshire revealed Lacombe as the most prominent contributor of breeding stock in the long history—then 70 years—of the breed in this country.

The reputation attained by Lacombe in pig production was exemplified by use of Mr. Wilson's bulletin in pig husbandry courses at universities. As early as 1939, he was referenced at the University of Saskatchewan as "the leading authority on swine husbandry in Western Canada." His bulletin attracted wide attention throughout Canada and was among the first departmental publications on livestock to be translated into French. Its third and final revision was published in 1954.

Much of the credit for accomplishments with pigs through this period, and indeed for the 25 years that followed, must go to the dedicated work of the head herdsman, Bev Harrington. Bev was the son of Lacombe's first veterinarian, Dr. Harrington, and his mother was a niece of Senator Peter Talbot. The appreciation and knowledge of livestock he acquired from his father made Bev a superb stockman and he dedicated his entire time, including weekends and holidays, to the welfare of the herd and the experimental work.

After closure of dairy operations in 1924, arrangements were made with the local creamery for supplies of buttermilk and whey used in nutritional experiments with pigs. One of Bev's first jobs at the piggery was to spell off Bill Anderson, driver of the "piggery wagon," who used to take daily delivery of 150 gallons (680 litres) of these products. Hogs on pasture were fed and watered from a hand-pushed cart with a barrel slung between its two wheels.

Bill Anderson, driving to or from the creamery with the buttermilk wagon, was a familiar sight in Lacombe until the mid-1940s. The only accident through these years was in May 1945 when the horse, startled by the honk of a car, bolted and threw Bill forward under the wheels. His pelvis was fractured and he was never able to return to any strenuous work. Jack Winchester took over these choring duties until 1947, when buttermilk ceased to be employed for feeding.

Apiculture The apiary at the station encouraged many local beekeepers and beekeepers' field days became a common event in the community, with lectures on bee husbandry and demonstrations in bee handling provided by Bill Cranna, the station apiculturist. An "out-apiary," established near Red Deer in 1926, was the focal point for many of these field days.

This specialized activity continued to expand until 1930 when 40 hives, the maximum number attained, were overwintered successfully. The highest production records were obtained in 1934—an average yield per colony of 217 pounds (99 kg) from 34 hives—with a maximum single record of 348 pounds (158 kg) that same year.

Experiments conducted during the period after 1920 produced much information of value to local beekeepers, but there was another activity that merits special mention. Quantities of honey were normally stored for feeding wintering colonies. On one occasion the honey fermented, reportedly by accident, and the beekeeper in testing the product before use discovered it had delightful medicinal properties. The discovery was of such excellence it simply had to be shared; then the demand grew to such proportions he had to investigate techniques for controlled spoilage. Needless to say there were many fellow employees who applauded—and enjoyed—his efforts, but official records for the station reveal that his experiments were never covered by a duly authorized project.

When this talented beekeeper retired he took his recipe with him. His successor, Joe Lahiff, did not savor this particular product until years later when he discovered two well-aged bottles while cleaning out the bee house. Only then did he fully appreciate the great expectations that had accompanied his initial appointment. Joe retired to Victoria in the mid-1930s and the last beekeeper was Fred Walker.

Discontinuation of apiculture in 1939 was viewed as a retrograde step by the beekeepers of central Alberta. But none lamented its passing more than those who had savored the marvellous product that helped to lighten the winter months.

Illustration stations

Work with illustration stations began in Alberta in 1914. The purpose, as defined by the title, was to provide visual demonstration of the crop production advantages associated with good seed and good husbandry techniques. Dr. J. H. Grisdale, successor to Dr. Saunders as Director of the Experimental Farms Service, was concerned that experimental results of value to agriculture were not reaching the farming public. He reasoned that this communications problem could be resolved by establishing permanent demonstrations on private farms located in the areas served by each experimental farm. Such sites, if located near main roads in developing areas and developed under direction of an agricultural officer, would provide greater accessibility to the farming public.

Thirteen illustration stations were established in southern Alberta in 1915. These were operated out of Lethbridge and R. E. Everest, one of the original employees at Lacombe, served as supervisor until 1934. During his tenure the number of illustration stations was expanded to include units located in the area served by Lacombe. One of these, Cheddarville, achieved fame in 1937 with the discovery that legume production on Grey Wooded soils (Gray Luvisols) was increased dramatically by the application of sulfur.

Supervision of Cheddarville and nine other locations in central Alberta became the responsibility of Lacombe in 1939. The first supervisor was Harry J. Mather, B.Sc. graduate in agriculture from the University of Alberta. He was no stranger to the role, having served in this same position at Lethbridge since 1935. He expanded the work with crop rotations, tillage methods, and fertilizer and varietal trials at these locations, but in 1942 he resigned his position to accept a job offer at a salary substantially higher than the $1800 per year paid by the federal government. His successor was A. R. Wilton.

Staff and station development

Mr. Reed's superintendency was a period of little growth of experiments with livestock. Some activities were discontinued—sheep in 1924, dairy manufacturing the same year, and dairy cattle in 1932—and animal populations, except those of horses and poultry, diminished steadily. From a 1920 inventory of 56 breeding females for each of pigs and cattle, the breeding populations declined to 19 head of cattle and 33 sows by 1940.

Construction activity was also minimal after 1924. The only major items were a new poultry plant office in 1935 (No. 32) to replace the original building which was remodeled as the poultryman's residence (No. 30), an extension of the piggery in 1935 (No. 25), the first greenhouse and header house in 1937 (No. 19), and a six-car garage in 1938 (No. 5).

Staffing, too, was minimal. The total technical support staff remained at two, Mr. DeLong and Mr. Wilson, until Harry Mather was appointed supervisor of the new Division of Illustration Stations in 1939. That these two men were able to maintain continuity and productivity of the experimental work was due in great measure to the dedication and continual service of several nontechnical employees. Chief among these was Seymour Edmunds, whose service as farm foreman lasted through the tenures of three superintendents. He was actually the first man employed by Mr. Hutton, was appointed farm foreman in 1911, and remained in this post until retirement in 1951. Then there were Bev Harrington, who began work in the piggery in 1924 and had been head swine herdsman for 41 years when he retired in 1970, and H. J. (Jim) West, who was head poultryman from 1929 until retirement in 1971. Two others with shorter but equally dedicated service were George McMillan Ramsay who was head gardener from 1929 to his retirement in 1956, and Bill Jardine who was beef herdsman 1924–1946.

Two employees comprised the office staff for Mr. Reed and his two assistant superintendents. Annah Aldwinkle, who filled for many years the dual role of secretary and bookkeeper, provided the continuity of office operations through the 1920s and 1930s. Miss G. M. Willis, who worked several years as her assistant, was followed in this position by Mrs. Paddison. Shortly before 1940, Dorothy Carter joined the staff as a replacement for Annah who had taken another job.

All minor construction, and some of the major construction projects, was performed by day labor under direction of the one carpenter, N. W. "Dad" Stahl. A kindly man with immense patience, he was a favorite of all children on the station—hence the nickname. His successor, Neil McFarlane, had joined the staff in 1933 and worked as a teamster before assignment as Dad's assistant. Two other longtime members of the staff were Jesse James (a distant relative of the Jesse James famed in song and story) and George Sykes.

One reason for the paucity of development during the 1930s was the Depression, which began with the economic collapse of 1928–1929. This was compounded by the climatic change which held much of the central and western parts of the continent in thrall from 1930 to 1937. Residents of central Alberta were more fortunate than most: they escaped the worst ravages of wind and drought which earned that period the title of the Dirty Thirties.

The economic depression had its effect on funding. The annual appropriation for station operations was reduced from $50 000 in 1929 to $33 000 in 1933. And Lacombe was not unscathed by the environment. The station report for 1929 recorded that year as the driest on record, with cutworm damage of exceptional severity. The following year was worse: all grasses and legumes established in 1929 were completely destroyed by cutworms in the spring, along with all plots of annual forages. High winds then blew out many of the cereal test plots; and all garden plots, even though surrounded by hedges, were destroyed. As early as 1926, Mr. DeLong had advocated maintenance of trash cover by replacing the plow with the cultivator for summerfallow operations. At that time there was no real concern about soil drifting, but events of the early 1930s underscored the merit of maintaining an adequate trash cover.

The breeding work with cereals and garden crops was suspended in 1930. Many promising lines and selections that had been under development did not survive the cutworms, drought, and wind. This line of activity was not resumed until the mid-1930s. World War II also interfered. By 1942, all eligible staff members had enlisted and the remaining workers were veterans of the first war, underage teenagers, or men declared medically unfit for service. Much of the farm work had to be suspended during this period.

Oddities in Mr. Reed's methods of fiscal and personnel management frequently strained his relationships with Ottawa and compromised station development, but they produced a rich folklore for his period in office. One story, still told with mixed emotions by staff members of that time, tells of the monthly delivery by the Superintendent of a sealed envelope to each nonclassified employee. This event became known as Surprise Day; when the envelope was opened the employee learned the dollar value that had been placed on his services for the previous pay period.

Another side of Mr. Reed's character was seen by the young people of his era. They remember him as a person who, by example, encouraged everyone to place a premium on neatness and appearance of the grounds. He would stop his car to pick up any trash, broken branches, or other litter that he observed on the station roads or borders. One man, employed on the farm crew as a young teenager during the war years, recalls Mr. Reed admonishing the foreman of the crew to "be sure you give this growing boy a break morning and afternoon for his milk and cookies." That was many years before coffee breaks were authorized for employees. On another occasion, Mr. Reed accidentally knocked down a chicken on a farm road. While his passengers—some young people on the way to a picnic—waited in the car, he got out, plucked and dressed the fowl, then hung it with a note of apology inside the screen door of the farmhouse.

Mr. Reed did not interfere with the work of his technical staff but neither did he take his senior assistants into his confidence. As a consequence, the 1943 memorandum from Experimental Farms Service Director, Dr. E. S. Archibald, regarding formulation of plans for the postwar period received a rather casual treatment at Lacombe.

In 1939, correspondence was initiated to increase the scientific support staff. The first requests were for a supervisor of illustration stations and specialists in forage crops and cereal crops breeding. This effort brought illustration stations and their supervisor, Harry Mather, to Lacombe that year and a position of graduate assistant in cereal crops was authorized in 1940. Don McFadden was appointed to the latter. Efforts were continued to secure the forage crops position, and technical positions in horticulture and livestock. These, however, were not to bear fruit until after 1946.

Shortage of pasture occurred prior to 1932, when the cattle herd was at maximum size and large numbers of mares were boarded at the station during the breeding season. During such periods all beef cattle not entered on the show herd were summered some 4 miles (6.4 km) distant from the station. To relieve this shortage, and also to provide additional area for cereal plots, negotiations were begun to acquire more land. The first parcel, purchased from the CPR in 1933, has remained in use since that date for cereal plots. Another quarter-section was purchased from Mrs. Staack in 1938. This was intended primarily as pasture and for raising hay crops. Although the remaining negotiations did not bear fruit until the year of Mr. Reed's retirement, the transactions he initiated increased the land area by 60% and brought land holdings of the station to approximately 800 acres (320 ha).

❧

CHAPTER 6

The Postwar Decade, 1946 to 1955

left
Teamsters and other staff members in 1946: back row (L to R), John Heidt, Paul David, Ed Linton, Earle Lowe, Harry Churchill, Bill Greenlaw, and Happy Wilson; front (L to R), Seymour Edmunds, Jack Healing, and Bud Davidson.

right
Retirement of Seymour Edmunds in 1950. Social Committee gift presented by Mr. DeLong to Mrs. Edmunds and Seymour (right).

When Mr. Reed retired in 1946 the technical staff comprised five people: George DeLong (1920), H. E. "Happy" Wilson (1926), Don McFadden (1940), Albert Wilton (1942), and Harry Leggett (1946). Mr. DeLong was appointed Superintendent, Don McFadden took charge of the cereal breeding work, and Harry Leggett was appointed to direct field crops work with emphasis on chemical and cultural methods for weed control. Two new appointments early in 1947 were Harvey Allen in charge of horticulture and Buck Stelfox in charge of forage crops.

Fred Stewart, who succeeded Seymour Edmunds as farm foreman in 1951, was one of the key employees. He was responsible for coordinating all maintenance and farming operations and providing support to the various research projects. Among the veteran members of his crew were Bob and Dunc McGeachy, Bill Greenlaw, George Sykes, and Griff Hughes. Office support staff included Irene and Leona Hopkins, Agnes Bruns, Marjorie Calder, and Roger Dickson.

With this staff, George DeLong began to rebuild the research support and facilities that, of necessity, had marked time during the war. First came expansion of the office space to accommodate the augmented scientific staff. This was facilitated by the fact that ownership of a parcel of land at Blackfalds, a relief RCAF airport during the war, had been transferred to the station in 1946. A mess hall was among several buildings on this land and permission was obtained from headquarters to move it to the station to serve as the office building (now No. 20).

This operation was completed in 1948. The total cost, including the removal and rebuilding of the "annex" of the former office to serve as a residence for the assistant farm foreman (now No. 2), was under $20 000. The new unit provided nine offices, a library, and one small laboratory. Quarters were exceedingly cramped—the largest office was about 9 × 10 feet (2.7 × 3.0 m)—but it seemed like paradise compared with the five rooms provided by the previous facility.

The next new appointee was an animal geneticist, Howard Fredeen, hired as an assistant to Happy Wilson in 1947. Meanwhile, Happy Wilson had been asked to consider the position of Superintendent of the Experimental Station at Melfort, Sask. When he accepted, DeLong began negotiations to fill this Lacombe vacancy by transfer of Jack Stothart from Ottawa. Approval was granted. Happy moved to Melfort in October 1948 and Jack arrived on 1 January 1949. He and other staff members would remember that date for many years as the occasion of the worst winter storm on record.

Jack Stothart was no stranger to the swine work at Lacombe. He had been deeply involved in the Department's Advanced Registry testing program in which Lacombe had cooperated during the 1930s, he had originated the Department's swine selection and breeding programs, and he had arranged Lacombe's cooperation in these programs in 1942. He was singularly well equipped for responsibility in swine breeding research. His M.Sc. thesis in 1936 produced the first scientific report in North America to deal with performance testing and it received immediate recognition by animal breeders on this continent as an authoritative reference. Like many other scientists, Stothart had interrupted his research for war service. He served in Europe with the Stormont, Dundas, and Glengarry Highlanders, rose to the rank of Major, and was awarded the D.S.O. in 1944. On returning to Canada in 1945, he picked up the reins of his research projects which, thanks to his detailed instructions of 1942, had continued during his absence.

The next technical appointments, all for illustration station work, were Alan Aitkin (1948–1951), Stewart Church (1949), and Lawrence Anderson who replaced Wilton on his retirement in 1951. In 1952 Don Walker was appointed to undertake soils research and a third member, Gordon Bowman, was added to the livestock staff. Bill Doran was appointed as assistant in forage crops research in 1953.

above and center
Superintendent's house in 1908 and after remodeling in 1947.

below
The 1915 piggery was enlarged in the early 1930s and a new Danish-style piggery (background) was constructed in 1948 to accommodate the expanded swine breeding program.

Facilities, too, were strengthened. The first item constructed (1947) was a 400-bird laying house (No. 31) to increase the poultry population for genetic studies. In 1948, an insulated hog building was constructed (No. 26), increasing the farrowing capacity by 30 pens. Contract construction began that same year on a large Danish-style swine testing barn (No. 24), and a large root cellar (No. 19B) was constructed to support the program in potato breeding. These items, and remodeling of the Superintendent's residence, were in addition to development of the office facility mentioned earlier. Much of this construction was done by day labor supervised by the head carpenter, Mike Goetz, a procedure that resulted in substantial savings to the federal treasury.

The field crops research program at Lacombe in 1946 occupied all the area suited by topography and uniformity of soil for this purpose. To permit expansion of this program, an adjacent (Gilmour) property of 225 acres (90 ha) was purchased in 1948. This increased the total area of the station to approximately 1625 acres (650 ha) including the 612-acre (246-ha) Blackfalds property some 10 miles (16 km) distant. An opportunity to consolidate the land holdings came in 1952 when Dr. Percy Talbot offered for sale the land homesteaded by his father, Senator Peter Talbot. Sale of the Blackfalds property and purchase of the Talbot land and an adjacent quarter known as the Lockhart farm was authorized 28 November 1952.

A major step undertaken by Mr. DeLong was establishment of a large substation at Vegreville for investigation of production problems with Alberta's Solonetzic soils. These soils, formed under saline conditions and characterized by high concentrations of sodium and magnesium ions and a compact, impervious B horizon, were known to occupy several million acres in Western Canada. In Alberta, they extended from Bruderheim in the north to Suffield in the south. The property at Vegreville was acquired in 1955 and Dr. Ross Cairns was appointed Officer-in-charge.

Emphasis on research activities, a postwar thrust in the Experimental Farms Service, had two discernible consequences. One was the importance given to the publication of scientific reports, which before 1946 had been actively discouraged by officials at headquarters. Technical staff, known as assistant superintendents, produced, analyzed, and interpreted results and prepared annual reports, information bulletins, and other items for their Superintendent who did such editing as seemed appropriate then sent the documents to headquarters in Ottawa with his name as senior author. The emphasis was on practical reporting that might be of use to the public and, with rare exceptions, all scientific publications emanated from headquarters. The change, made about 1946, opened the door to publication by individual members of the technical staff employed at Branch locations.

The other consequence was in the educational qualifications required of appointees to technical positions. The fledgling Branch in the opening decades of this century specified graduation from a recognized university as essential for appointment as Superintendent or Assistant Superintendent. Since few Canadian universities offered postgraduate training, the bachelor's degree represented the highest level generally available. George DeLong may have been the first Branch employee outside Ottawa to seek a higher degree. In 1928 he was granted educational leave for postgraduate studies in animal nutrition at the University of Alberta. He returned to his job at Lacombe in 1929 with an M.Sc. degree. The next employee with an M.Sc. degree was Don McFadden, who completed postgraduate studies at the University of Minnesota in 1941. Two appointees in 1947, Harvey Allen in horticulture and Howard Fredeen in animal husbandry, had their M.Sc. degrees and Buck Stelfox, appointed that same year in forage crops, left immediately for postgraduate studies at the University of Minnesota. Several new positions added in the next decade were filled by B.Sc. graduates, several of whom subsequently took advantage of the educational leave program to seek advanced degrees in their areas of specialization. Employees who obtained Ph.D. degrees in this way were Howard Fredeen (1952), Jack Newman (1960), Gordon Bowman (1961), and Huib Doornenbal (1961). By 1960, postgraduate training, usually to the Ph.D. level, had become a prime requisite for hiring of scientists.

Research developments in the postwar period included an increased emphasis on experimental design and biometrical analyses of data. The station acquired its first hand-cranked Munro calculator about 1940, but this machine was not used for statistical analysis until about 1947. This reflected the training background of the technical staff. Both George DeLong and Happy Wilson had appreciated and applied the principles of experimental replication from the outset of their work, but their university training predated the introduction of biometrics and it remained for the augmented scientific staff, starting with Don McFadden, to introduce this expertise to data analyses and interpretation.

Field crops

Cereals Don McFadden continued the varietal testing and expanded the cereal breeding programs that had been conducted by George DeLong. He also expanded the cooperative trials with cereal varieties to secure a broad perspective of their adaptability under the varied soil and climatic conditions served by the station. Since this area extended from Calgary north to Lesser Slave Lake and from the Saskatchewan border to the Rockies, an area approximately 350 by 250 miles (563 by 402 km), the cooperative testing work involved considerable travel and labor for soil preparation, seeding, maintenance, and harvesting of the plots.

Out of the testing work came recommendations from Lacombe for adoption of many varieties produced by breeding programs in Ottawa or at western universities. These included Thatcher, Saunders, and Lake wheat; Eagle, Beaver, and Rodney oats; and Olli, Montcalm, Vantage, Husky, and Gateway barley. The first new crop variety produced by breeding research at Lacombe was Larain oats. This variety, released in 1946, proved a popular special-purpose variety where early maturity was essential. Maturing about 2 weeks earlier than Victory, a standard variety of that era, it possessed superior lodging resistance and had a plump, attractive kernel. A new barley variety, Wolfe, was released in 1954. It had superior resistance to lodging, but its usefulness was limited by susceptibility to foliage diseases.

In the spring of 1949 Lacombe was designated the coordinating center for the northern wheat breeding project. Don McFadden headed this work, which was to serve an area that produced approximately 40% of all the wheat in Western Canada. Breeding programs with oats and barley were also intensified, in recognition of the fact that three-quarters of the oats and over 80% of the barley produced in the province came from the area serviced by the Lacombe station. The immediate postwar period featured a rapid.expansion of the farmlands brought under cultivation and, by 1956, the area from which barley was harvested exceeded 3 million acres (1.2 million ha).

Don McFadden introduced the concept of applying selection indexes for agronomic characteristics in all the cereal breeding work. Selection programs with wheat placed great emphasis on rust resistance and he observed that, in the absence of rust, some of the new varieties were inferior in yield and other important agronomic characteristics to some of the "historical" varieties. He also noted that early varieties, particularly of oats, were inferior in yield and, in 1954, he initiated studies to clarify the genetic relationships of yield with rate of root development, tillering habit, rate of growth, and kernel size.

Lacombe continued to be a center for maintenance of Foundation seed stocks and was designated by the Canadian Seed Growers' Association as the Foundation source for Legacy, Larain, and Eagle oats; Sanalta and Wolfe barley; and Petkus fall rye. Lacombe also continued its cooperation, begun in 1930, in the crop testing plan of the Searle Grain Company to test the varietal purity of commercial seed grain. This involved the growing of seed samples submitted by growers through their local elevator agent. More than 4000 such samples were grown and evaluated from 1947 to 1956. On behalf of the Canadian Seed Growers' Association, Lacombe also evaluated seed samples from Elite and Foundation growers. Special tests for other agencies included evaluation of commercial seed treatments for control of seed-borne diseases (Dominion Plant Pathology Laboratory at Winnipeg) and tests for the incidence of smut and other diseases of cereal crops for the Winnipeg Rust Research Laboratory.

Studies on rates of seeding for all cereal varieties were continued through this period. These tests, using kernel counts rather than weight of seed sown per unit area, indicated some yield advantage in use of seeding rates lighter than thoses conventionally employed. This result had significant economic importance.

Forage crops Shortage of staff and labor during the war years necessitated a substantial reduction of all forage crops work. Work was not resumed until Buck Stelfox returned from postgraduate work in 1948. He reinstated the varietal tests of perennial forages in single-crop and mixed stands, enlarged the testing of annual crops, and introduced tests on cultural and management methods for establishing and maintaining perennial crops to complement information obtained in previous work.

He also introduced several new lines of work including breeding of red clover resistant to the disease northern anthracnose, pasture investigations employing simulated grazing techniques, and seed production studies with creeping red fescue, Russian wild ryegrass, and alsike clover. With Bill Doran's appointment to the forage crops

opposite page • above
The cereal division staff in 1954 comprised (L to R) Percy Cowan, George Reed, Jack Van der Wal, Earle Lowe, Don McFadden, and Arnold Machan.

opposite page • below
Buck Stelfox (right) and Bud Davidson with strains of red clover under greenhouse test in 1954 for resistance to northern anthracnose.

left
Forage crops crew in 1954 with Henry Vos (left), Ron Amundson, Ron Spink, and Jim Heath.

staff in 1953, the pasture investigations were expanded in cooperative work with the animal husbandry section and studies on weed control for cultivated and native pastures were undertaken in cooperation with the field husbandry section. With the single exception of the pasture grazing studies, all tests of varieties, fertilizers, and husbandry methods for forage crops were conducted on several off-station sites including the illustration stations. They also formed part of the program at Vegreville.

These activities were matched by a large output of bulletins and extension reports dealing with results from current and past work. Buck Stelfox quickly became a recognized authority on forage crops and was in continuous demand at extension meetings and as an adviser to the Highways Department, National Parks, and other agencies seeking expert advice on regrassing of rights-of-way, grazing management of park areas, and development of policies for grazing of forestry lands. Unfortunately his promising career was terminated abruptly by a tragic car accident on 1 April 1957.

Field husbandry Crop rotation studies, some of them a continuation of the work begun in 1910, were an integral part of the work in field husbandry. Analysis of results indicated a progressive increase in yields of wheat from the long-term mixed rotations and a progressive decrease from the continuous grain or grain–fallow rotations. Research to identify the reasons for this decline started with the appointment of a soils specialist, Don Walker, in 1952. He initiated studies on differences between rotations in fiber content of the soil, moisture reserves, and levels of various plant nutrients in the soil.

Don's studies on fiber content of the soil indicated the need for greater emphasis on tillage methods for returning crop residues to the soil, and this led to appointment of an agricultural engineer, Don Dew, in 1956. They also revealed unexpectedly high infestations of viable seed of wild oats—in some rotations the top 8 inches (20 cm) of soil contained as much as 40 bushels per acre (1650 kg/ha) of this seed. This directed attention to cultural methods including tillage and dates of harvest, and to herbicides for control of the problem.

Commencing shortly after the war, the use of herbicides for control of annual and perennial weeds became a prominent feature of the field husbandry work directed by Harry Leggett. A war-surplus jeep converted for use as a field sprayer, and several hand-powered plot sprayers fabricated in the farm shop, were used for applying 2,4-D in experiments on optimum dates and rates of application with different crops and various weed species. Experiments were also begun on the use of herbicides to control woody shrubs and tree regrowth following land clearing. Harry was appointed Superintendent of the Regina Experimental Station in 1953 and his successor, Henry Friesen, who transferred from the Experimental Station at Scott, greatly expanded the research with herbicides. New chemicals were introduced as they became available, field-scale studies were conducted with cooperating farmers, and emphasis was given to herbicide applications in conjunction with tillage techniques for control of wild oats and various persistent perennial weeds including quack grass, Canada thistle, leafy spurge, and sow-thistle.

During this period Don Walker greatly increased the volume of off-station testing with chemical fertilizers. His experiments were conducted continuously at 14 off-station sites including several locations in each of the soil zones that occurred within the area serviced by Lacombe. Particular attention was given to the sulfur-deficient Grey Wooded soils (Gray Luvisols).

Livestock

Cattle Bangs disease continued to be a problem with the cattle herd. Calfhood vaccination, initiated as a control procedure in 1946, could not be evaluated until the heifers came into production and the culling of reactor cows was deferred to ensure a "strenuous" test of the efficacy of the vaccination program. This part of the testing work was conducted in conjunction with the Animal Pathology Division of Dominion Science Service. To control spread of the disease the practice of year-round breeding was replaced by a 10-week midsummer breeding season, the cow herd was placed under an outdoor management regime, and the only animals to enter the barn were young bulls for performance testing. The change in breeding practices also provided animals of uniform age for the testing program.

The testing program was intended to serve three purposes. One was to develop testing procedures appropriate for genetically meaningful performance evaluation. The second was to provide detailed information on pre- and post-weaning growth curves for beef animals. The third purpose was to provide information to be used in a program of selection for rapid growth rates of potential herd sires. Calves were weighed weekly from birth to 1 year of age, milk production of the dams was measured weekly from calving to weaning, and complete feed consumption records were taken during the post-weaning period.

Results from the vaccination program were analyzed in 1949. Full control had not been achieved but the data indicated that any heifer that gave a positive test at the time of vaccination (less than 8 months of age) was unlikely to respond favorably.

Selection studies also began in 1949. Two half-brothers produced within the herd, one with a high growth rate and the other with low one during the post-weaning performance test, were mated to contemporary groups of females. Results from 3 years of matings clearly demonstrated the effectiveness of selection for genetic improvement of growth rate. This evidence, reported by Howard Fredeen to the 1952 annual meeting of the Canadian Society of Animal Production and to the Animal Husbandry Staff Conference convened at the same time by the Dominion Animal Husbandman, Dr. Karl Rasmussen, led to the first cooperative beef breeding project in the experimental farms system. The cooperating centers were Brandon, Indian Head, Scott, and Lacombe.

Horses In 1946 a new horse breeding improvement policy was launched by the federal government and 10 stallions were imported by the Department of Agriculture from the British Isles. Two of these, the 3-year-old Clydesdale Muirton Masterpiece -29991- and the 4-year-old Thoroughbred Warrenpoint -4895-, were stationed at Lacombe. The ancestry of the latter was studded with individuals possessing impressive racetrack winnings. Services to the Clydesdale were free but Warrenpoint commanded a fee of $50 for registered mares and $10 for grade mares. In both cases the pasture fee was $4 per week. In 1949 the stallions were augmented by acquisition of an outstanding imported Percheron, Koncarhope. He was later replaced, as were the other stallions, in accordance with the policy of rotating studs to avoid any likelihood of inbreeding.

This service was fully subscribed each year, with mares brought for breeding from a radius of 300 miles (480 km). At the peak of each breeding season there were in excess of 150 mares on pasture at the station awaiting breeding or pregnancy testing. Excellent conception rates were recorded, a tribute to the capabilities of the groom, Harry Churchill. He had received his early training in horse breeding in England and his skill in handling horses was matched by his penmanship. All his meticulous records were kept in a flourishing calligraphic style that was the envy of all.

A humorous incident during this period of horse breeding started the night the Thoroughbred stallion was required to work overtime. Griff Hughes, one of the teamsters, returning to the station boardinghouse about 10:00 pm, observed an unknown person leading the stallion into the barn. Following at a discreet distance he secured the license number of a truck departing the scene with a mare in the back.

The RCMP, notified the following day, had no difficulty in identifying the culprit. He was well known for various activities of doubtful legality. But before pressing charges they wanted to have the crime defined. That proved difficult. There was no such crime as "theft of semen" and the stallion did not appear disturbed by the night's proceedings.

The sequel to the story came the following summer. The culprit demanded that the station sign papers (as owner of the stallion) for registration of the resulting foal. This demand was rejected in light of the circumstances, but the man persisted to the extent of notifying—in writing—the Minister of Agriculture that the station was in contempt of the Pedigree Act for failure to provide service papers. Only after lengthy correspondence was the Department persuaded to accept the facts presented by the Superintendent.

Harry Churchill was granted two extensions of employment after age 65, and with his departure in 1958 the long chapter on horse breeding was closed. Five geldings were retained for choring work but all mares were sold and the stallions transferred to other locations. During this 9-year period, the original stallions and their successors at Lacombe bred 1553 mares.

Swine Commencing in 1947, swine research at Lacombe concentrated on breeding and genetics. Some management, nutrition, and other nongenetic studies continued but all these were directed to improving techniques for genetic evaluation of breeding stock. This was in keeping with a policy decision made by the Experimental Farms Service to designate areas of expertise specific to each station. Lacombe was specified as the western location for specialization in animal breeding. Two projects, one on inbreeding and the other a "high–low" selection study, were already in progress, having been initiated by Jack Stothart in 1942. The other major project, the development of a new breed of swine based on a crossbred foundation, began in 1947.

The latter was an audacious undertaking. The Yorkshire, the dominant breed in Canada, had achieved national prominence by virtue of its high reproductive performance and unchallenged carcass merit. Its supremacy over other breeds had been amply demonstrated by years of work at the Lacombe station, and that there might be alternatives was considered unthinkable. Further, the practice of crossbreeding was contrary to long-standing policies (such as the purebred sire legislation) which vigorously promoted pure breeding as the primary means for genetic improvement of livestock, and crossbreeding was opposed by all levels of government. Although many producers of commercial hogs did use crossbred females for litter production, their breeding programs were described as mongrelization and experimentation relating to the reproductive performance of crossbreds did not receive support in Canada.

But winds of change were blowing. Research initiated at the University of Minnesota about 1930 had provided convincing evidence of the reproductive superiority of crossbred females. These results encouraged some producer groups, notably the Blindman Valley Hog Producers Cooperative of Central Alberta, to press for revision of the traditional attitudes and policies relating to swine breeding in Canada. The arguments they advanced received strong endorsement in reports submitted by R. M. Hopper (1944) and R. D. Sinclair (1945) to the Canadian Society of Technical Agriculturists (subsequently renamed the Agricultural Institute of Canada) and, in 1946, a Departmental committee was established to prepare long-term plans for swine breeding research. This committee, of which Jack Stothart was a key member, recommended that top priority be given to developing a new white breed or breeds that would compare favorably with the Yorkshire in productive merit and would, in crosses with the Yorkshire, produce growthy pigs of good carcass type. The recommendation was accepted and the committee proceeded with detailed planning.

The foundation breeds had to possess the characteristics desired in the new breed, be genetically distinct from each other, and be unrelated to the Yorkshire so that crossing with that breed would produce hybrid vigor. With these requirements in mind, the Danish Landrace, Chester White, Berkshire, and Minnesota No. 1, the latter a new breed developed at the University of Minnesota, were chosen. Two lines were planned, one based on Berkshire and the other on Minnesota No. 1 females, with the Danish Landrace and Chester White as the common male component. Foundation animals were purchased in Ontario and the United States, and shipped to Lacombe in the early summer of 1947; breeding began immediately.

But there were problems ahead. For the inbreeding studies begun with Yorkshires in 1942, breeding stock had been transferred to Lacombe from several other locations and some of these animals had the short upturned snouts then in vogue in the show ring. Initially this was considered a genetic characteristic but, by 1946, it became clear that something more serious was involved and veterinary examination revealed the presence of the nasal infection known as atrophic rhinitis. The problem increased in severity as population pressures increased, being particularly acute among pigs born under dusty conditions on pasture or fed dry rations after weaning.

Adoption of management procedures that eliminated dusty conditions minimized the outward evidence of infection, and breeding projects begun in 1942 were completed successfully. One inbred Yorkshire line, derived from the herd developed by Happy Wilson, had given outstanding performance and was retained when the remaining lines were disbanded in 1950. The high–low selection study, completed in 1952, provided clear direction on the manner in which the Advanced Registry program should be used for genetic improvement of breeding stock. The Minnesota No. 1 and its crosses were also discontinued in 1952, having proved inferior to the BW (Berkshire × Landrace–Chester). Discontinuation of these lines of work released facilities for expansion of the BW foundation.

In 1950, a major decision had to be made regarding herd health. Veterinarians recommended complete depopulation, with repopulation—preferably by the then new technique of surgical delivery—only after a thorough cleanup of the facilities and an extended period of disuse. Adoption of this recommendation would have meant abrupt termination of all the work; but it was evident that the work would fail unless the disease was controlled. After long deliberation, the choice made was to live with the problem and attempt to resolve it by intensifying established management procedures, eliminating carriers by routinely culling all breeding stock that showed any evidence of infection, and closing the herd to all outside stock.

This decision was vindicated by results. Veterinary examination of heads and lungs from all pigs slaughtered in 1952 revealed no lesions and, although veterinarians were guarded in their interpretation, they gave approval to expansion of the BW foundation to two Saskatchewan locations, the Scott Experimental Station and the Indian Head Experimental Farm. Results in 1954 at Lacombe and these two cooperating locations indicated freedom from any health problems and an extensive field test was authorized for comparison of progeny from Yorkshire and BW boars produced in commercial herds in Alberta.

By this time the project had attracted wide attention in Western Canada, and the Lacombe Board of Trade decided the time had come for formal naming of the foundation. By letter to the Minister of Agriculture they recommended the name "Lacombe," and this name received official sanction in June 1955. Breed development and field testing were far from complete, but looking ahead to the possibility of public release it was clear that details of registration and distribution of the breed would require much advance work.

To ensure that any decision on release would be based on thorough and impartial evaluation of all relevant evidence, an Alberta Advisory Committee on the Lacombe Breed was established in August 1955. Members of the committee were W. H. T. Mead, Alberta Livestock Commissioner; Drs. L. W. McElroy and R. T. Berg of the University of Alberta; Roy Marler, Alberta Federation of Agriculture; and J. L. Pawley and M. Syrotuck of the Marketing Service, Canada Department of Agriculture. The first meeting of this committee recommended expansion of the field testing program and establishment of Lacombe herds at the Olds and Vermilion schools of agriculture. By year end, these two herds were established and Lacombe boars were located in 23 cooperating commercial herds for comparison with Yorkshires. Field tests were expanded in 1956 and 1957 and the results obtained led to the eventual recognition of the Lacombe as a new Canadian breed.

The postwar period saw a major expansion in the collaborative work with the Production and Marketing Branch of the Canada Department of Agriculture. Collaboration actually began in 1928 with the testing work that guided development of the Advanced Registry program for purebred swine. This phase ended about 1940, but a new phase began in 1949.

above
Jack Newman, restraining piglets for radiography (1955)

below
Jack Newman, measuring backfat with the "lean meter" (1955)

Jack Stothart, as scientific adviser to the Advanced Registry Board from 1933, had been responsible for all genetic analyses of data collected under the policy. These responsibilities followed him to Lacombe where he, with Howard Fredeen, initiated a program of comprehensive technical support to the Production and Marketing Branch that has endured to the present day.

The first major technical assignment was the genetic analysis of feedlot and carcass records for more than 12 000 pigs tested under the Advanced Registry policy from 1939 to 1950. This formed the basis for Ph.D. studies in animal genetics undertaken by Howard Fredeen at Iowa State College in 1950–1951. The results of this study had international significance because they derived from the largest data set that had ever been assembled for the purpose. But of greater significance was the statistical and analytical technology brought back from Iowa. By today's standards the computer equipment was primitive, involving punched cards, rooms full of cumbersome equipment, and many hours of work to wire control "boards" specific to each task. The same analyses can now be performed in seconds using cassette tapes and a desk-top computer. But primitive as it was, this process was infinitely superior to the alternative, the hand-cranked Munro calculator. It made feasible for the first time the complete statistical analyses required for genetic interpretation of large data sets and became the backbone of subsequent work at Lacombe. And its introduction at Lacombe marked the beginning of the computer age for Canadian animal breeders.

The Experimental Farms Service did not have such equipment, but Lacombe made arrangements to operate facilities of the RCAF located in Ottawa. This arrangement continued for several years. One large analysis performed during the period utilized data from Denmark. In 1955, Howard Fredeen accepted an invitation from Professor Clausen of Denmark to review that country's progeny testing program. His work in Copenhagen and at the computer facility in Ottawa provided information on test management procedures which, coupled with Lacombe data on feeding methods (hand- versus self-feeding), served to guide development of the Canadian pig testing program during the following decade.

Poultry Research on the inheritance of reproductive performance in the chicken was intensified in 1947. Reciprocal crosses of the White Wyandotte and New Hampshire (a breed introduced in 1947), using standardized artificial insemination techniques, revealed that sperm produced by White Wyandotte males had a 25% shorter lifespan than sperm from New Hampshires. Concurrent physiological studies established that this difference was associated with breed differences in gonad size and thyroid activity

During these studies the observation was made that matings among single-comb Wyandottes generally gave much higher fertility than matings among rose-comb parents. This led to the final work with Wyandottes. Two flocks were developed, one genetically pure for the dominant rose-comb allele and the other pure for the recessive single-comb allele. Reciprocal matings of the two genotypes revealed a 15% superiority of fertility for males with the recessive gene.

The work terminated at this point to make room for a large-scale study in population genetics. However, the investigations continued at other institutions, using breeding stock provided by Lacombe. Subsequently Dr. Crawford, using this foundation material, was able to confirm the multiple (pleiotropic) effect of the rose-comb allele.

Illustration stations

During the mid-1940s the illustration station work begun by Harry Mather was expanded by Albert W. Wilton, and a second supervisor, Alan R. Aitken, was appointed in 1948. Eight illustration stations and three district experiment substations with a total plot area of approximately 300 acres (120 ha) were located at Acme, Athabasca, Bonnyville, Castor, Chauvin, Cheddarville, Evansburg, Leslieville, Metiskow, Ryley, and St. Paul. Each location served specific requirements: tillage and other methods for control of wind erosion played a prominent role in the more arid locations along the eastern boundary, while soil fertility problems were stressed through the western and northern regions; but a common element was provided by the emphasis on husbandry techniques and varietal testing.

All the scientists at Lacombe were involved in the work undertaken, and the emphasis gradually shifted from demonstration to fact-finding. The annual field day at each location was a special occasion. It included tours of the plots, discussions led by various scientists on recent advances in agricultural science, and feature programs for the ladies. All the men, scientists included, shared in the erection and dismantling of the large marquee tent.

These events were well attended—69 meetings over the 8 years prior to 1947 attracted a total audience of 11 400—and the advances in farming practices noted in the areas surrounding these stations gave testimony to the value of Dr. Grisdale's pioneer concept. But it was not a one-way street; scientists attending these field days always gained a new insight into practical problems. This sharpened their focus on the kind of research required and greatly enriched their experimental programs.

Carcass research

During the initial years of the selection programs with beef cattle and pigs, carcass merit of breeding stock had to be predicted from measurements taken on slaughtered sibs of progeny. This was not an efficient procedure; the accuracy of prediction increased with the number of carcasses measured but slaughtering required the sacrifice of prospective breeding stock and diminished the opportunities for selection. Howard Fredeen, in a series of theoretical papers, demonstrated the potential merits of performance testing and, in collaboration with Jack Stothart, initiated experiments to evaluate relationships between conformation of the live animal and structure and composition of the carcass.

The first studies (1947–1952), conducted with the assistance of the Swift Canadian Co. Ltd. of Edmonton, indicated little relationship between conformation scores and carcass measurements or commercial grade for either cattle or pigs. Starting in 1951, the conformation scores for cattle were augmented by live-animal measurements, and this procedure was extended to pigs in 1952 with emphasis on ham development. Carcass evaluation for the pigs included specific gravity and full tissue dissection of the ham cut, the first time either technique had been employed in animal breeding research. From this research came the recommendation that direct measurements of fat or lean were basic requirements for predicting carcass composition, and the search began for techniques for securing one or both of these measurements on the live animal.

An ultrasound technique developed during the war for measuring the depth of tissue damage in flesh exposed to frostbite was investigated in 1952, but the equipment proved too cumbersome. In 1954, a probe device that utilized the differential electrical conductivity of fat and lean tissue was employed to measure subcutaneous fat, and preliminary work was started on radiographic (X-ray) techniques for measuring both backfat and carcass length (vertebral size) of the live pig. For both techniques, the measurements recorded were correlated with carcass measurements taken after slaughter. These activities continued into the next decade.

Staff and social events

George DeLong retired in 1955 and his successor, Jack Stothart, became the last Superintendent in the long history of the Lacombe Experimental Station. In 1959 the Experimental Farms Service was reorganized under a new name, Research Branch. The Lacombe Experimental Station was renamed the Lacombe Research Station and the title of Superintendent was replaced by Director. Thus Jack was both the last Superintendent and the first Director at Lacombe.

One of George DeLong's strengths throughout his 10 years as Superintendent was the liaison he had with members of his staff. He treated all station employees as a family, referring to them as "my boys" or "my girls" in all public addresses, and took time to discuss with them all issues, large or small, relating to the public image of the unit or future plans for the station. Formal staff meetings were rare events but every coffee break was an occasion for an informal briefing and discussion relating to station development and research programs. This approach resulted in a high degree of staff harmony, excellent morale, and a full sharing of expertise in project planning.

Another strength was his perception of the role of the station in community activities. He encouraged staff members to participate in community affairs and did not hesitate to contribute men and equipment in support of worthy community projects. By his actions the station and its staff achieved a high degree of respect and acceptance in the community. Each staff hour spent in nonstation activities was more than compensated for by many unpaid hours in mornings, evenings, and weekends spent working in the fields or the office. Both the station and the community were losers when new regulations of the Branch terminated these laissez-faire arrangements.

George DeLong also had the perception that specialists were not stronger than their weakest link in terms of general knowledge. In this context he was far ahead of his time in advocating interdisciplinary research. Animal specialists were encouraged to get actively involved in all aspects of crop and field husbandry, and vice versa. All were encouraged to ensure their programs had both technical and practical relevance to production problems. And all were encouraged to make discerning appraisals of government or other policies that related to agricultural production. Field days, whether for animals or plants, were attended by—and usually addressed by—all scientists regardless of their area of specialization. All participated actively in work and field days of the illustration stations, in extension field days or short courses sponsored by the Alberta Department of Agriculture and various sectors of the industry, and on a wide variety of committees established by industry and various levels of government.

Mr. DeLong and his staff were well aware that these activities were somewhat contrary to the view that education (and thus extension) were the prerogative of the province, not the federal government. And they were well aware that these activities were not a general policy of the Experimental Farms Service. But all at Lacombe were convinced that research must be tuned to the real needs of the farming community and that research results had little relevance unless used by the producer. As a result of this conviction, the Lacombe station and its staff became widely known and respected in agricultural circles throughout Western Canada.

The "family" association of staff members was consolidated in 1946 by organization of a social committee. The concept grew from informal discussions of ways to introduce new members to the staff, recognition of special occasions in the lives of individuals and the station, and promotion of social and plain fun events.

The first meeting, held 31 July 1946, elected Don McFadden as President, Harry Leggett as Secretary-Treasurer, and executive members Jim West, George Ramsay, Harry Churchill, and Fred Stewart. The first order of business was arranging a farewell party for the retired Superintendent, Mr. Reed. Mr. DeLong donated $60 toward expenses and the party took the form of a picnic lunch followed by entertainment and presentation of a gift. The next meeting, a month later, centered on a party and gift for retiring carpenter Neil McFarlane, which served as the prototype of the corn roast held annually from that time. Business of the final meeting in that formative year included provision and furnishing of a reading lounge in the boardinghouse, organizing a Hallowe'en party, and arranging a Christmas party for staff families.

This inaugural executive exhibited exceptional industry and foresight. The activities they initiated were adopted as annual events in the years that followed. These included the spring mixer which welcomed all seasonal and other new employees into the family, the fall corn roast and farewell party for seasonal workers on their way back to school, and the Christmas social and children's party with Santa's arrival to deliver gifts and candies. Younger brothers and sisters of single employees were included in the latter event. Other activities begun the second year included formation of staff leagues for badminton, bowling, and curling, bingo as a fund-raising event, and an entry into the community softball league.

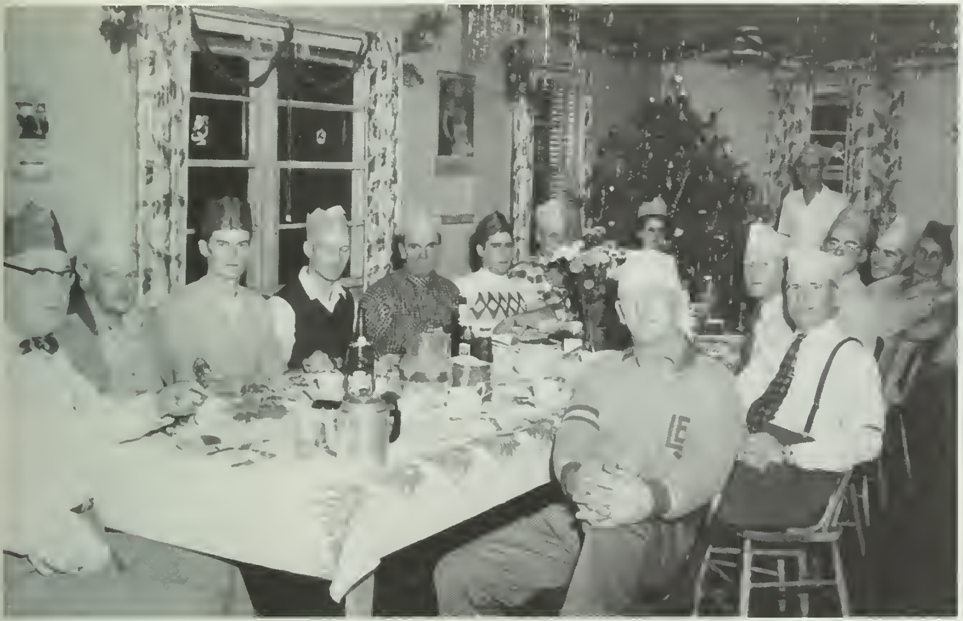
The Pavilion became the focal point for these events. This building, still in use in 1982, was built in 1935 under a federal winter works program in support of the Lacombe and District Agricultural Society. In return for this support the society donated land for the building site and an access road, and the facility was placed in the custody of the Experimental Station. Throughout its years it has served as a community center, dance hall, exhibition hall, and sales pavilion for purebred livestock. For the quarter-century beginning in 1935 the chief attraction each year was the annual horse sale. This 3-day event, the largest of its kind in Western Canada, recorded peak sales in excess of 1100 head with buyers from every province in Canada. Horse sales ceased in 1950 but purebred cattle sales, once annual events, have increased to more than 20 a year.

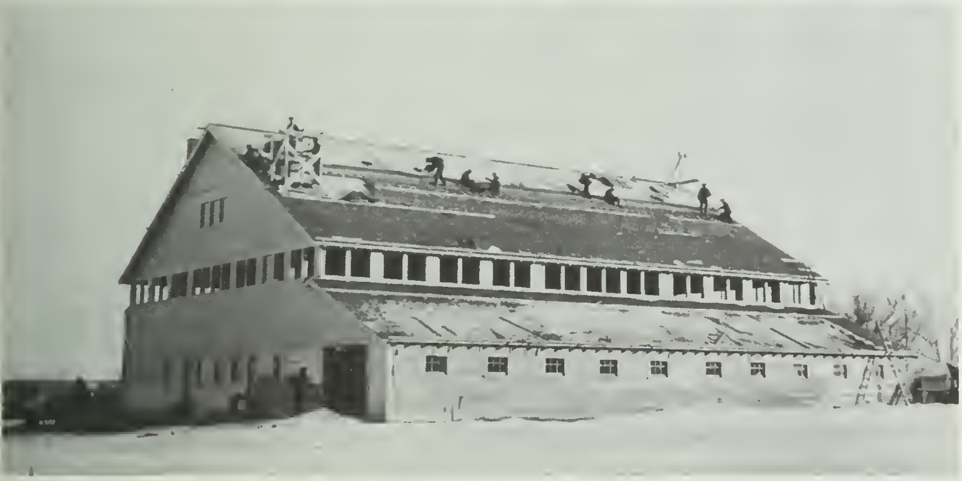
Station staff were involved in all these activities but the most enduring memories attached to the facility have been the social events sponsored there by the station social committee or its individual members. Many of these, including all farewell parties, were specifically designed to include nonemployees. Indeed, for many years it was difficult to define where staff events ended and community events began. One sample was the monthly Assembly Dance series begun in 1948 by Jim West and Howard Fredeen as a project to raise funds for construction of the Lacombe Memorial Center. Community support exceeded all expectations and the project enabled the committee to make a substantial contribution to building a center that has since become the hub of community activities.

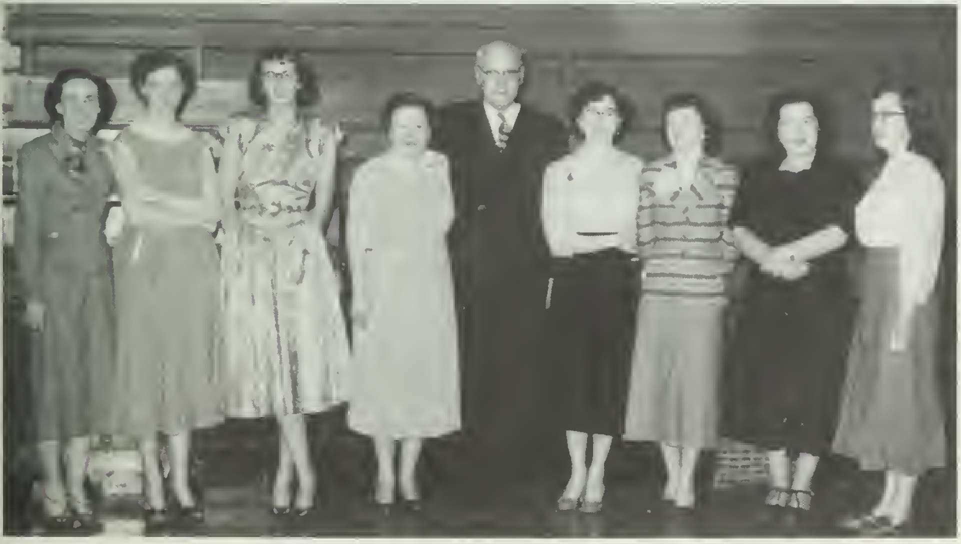
Retirements received special attention from the Social Committee. The usual format included supper, light entertainment and presentations, with families and community friends of the honored guest in attendance. The entertainment always included an irreverent sketch of career highlights, invariably in doggerel verse and frequently sung. This reached its ultimate expression on the occasion of Mr. DeLong's retirement. For this event, Howard Fredeen, Jack Newman, and Jim West composed an operetta featuring the life and accomplishments of the special guest. Gordon Bowman, in preparation for the central role of the drama, secured a suit of clothes from Mr. DeLong by pleading poverty. Staff members rehearsed their choral roles and stage duties and Jackson Ede, then bookkeeper at the station, perfected his responsibilities as pianist. Then came the big night. The early years of Mr. DeLong's career were enacted on the stage with the support of the pianist, lead soloists, and chorus. Then the lights went down for the final act and Gordon Bowman, dressed in the boss's clothes, entered to seat himself at his desk. The impersonation was so perfect that Betty, George DeLong's daughter, was heard to gasp, "My God, it's Dad!" Then Leona Soley, secretary at the station, seated herself on his knees and to the tune "Streets of Larado" sang a song which began:

"We're sorry you're leaving; you've had us believing
That we are the very best staff in the land.
The new man they're choosin' may spoil the illusion,
And flatten our pride 'neath a stern ruling hand.

Lacking in respect perhaps, but the song and the evening expressed the nostalgia of the occasion. There were many other retirements in the years that followed but none evoked the same feelings of a family separation as this evening, which marked the end of a career begun at Lacombe in 1920.







above
Christmas dinner, 1954, in the boardinghouse. Clockwise from left: Mr. DeLong, Bill Greenlaw, Dick Gillespie, Dick Clemens, Griff Hughes, Percy Cowan, Jake Schulte, Donna Warren, Ken Warren and Mrs. Warren (boardinghouse keeper), J. J. McNeil, Irvin Cowan, Gwylm Lloyd, Bev Harrington, and George Sykes.

center
The Central Alberta Livestock Pavilion under construction in December 1935. This became a center for major activities of the station social committee.

below
The office staff at the social committee farewell party for Mr. DeLong: (L to R) Iris Hopkins, Nedra Moore, Jean Pountney, Mrs. DeLong, George DeLong, Leona Hopkins, Joan Woods, Aggie Bruns, and Lorraine Malmas.

CHAPTER 7

Two Decades of Growth, 1956 to 1975

The four superintendents of the Lacombe station during the period 1906–1976 (L to R) George Hutton (1906–1919), Frank Reed (1920–1946), George DeLong (1946–1955), and Jack Stothart (1955–1976) The position title changed to Director in 1959 and Jack Stothart was both the last Superintendent and the first Director

Mr. Stothart's first years as Superintendent were occupied with implementing the long-range plans for the station documented during the early 1950s. Included in this document were proposals to construct a new office–laboratory building, new facilities to house the expanding livestock work, and greenhouses for plant breeding and crop management studies; and to upgrade roads and services. Natural-gas service had been installed to all farm buildings in 1947, the year Northwestern Utilities first came to the community, but the 1907 sewage system consisting of individual cesspools for each building had never been upgraded. Calgary Power had installed electricity to the farm many years previously but the system was no longer adequate to service the expanded needs.

The long-range plan was approved. Water and sewer services were installed in 1954 and construction began in 1955 on a modern hog testing facility equipped to permit individual measurement of feed intake for each test pig. The building (No. 28) also included an X-ray room for radiographic measurements of tissue development on live animals. The new water system was linked with the underground services installed in 1924 and the farm well, drilled in 1912 to service the dairy manufacturing building, was linked with the town system as an auxiliary water supply. Fire hydrants, also installed at this time, replaced the single unpressurized hydrant that had served since the mid-1930s for emergency fire protection.

The remaining construction items did not receive approval until after Jack Stothart was appointed Superintendent in 1955. But once begun, construction moved swiftly. Sod for the new office–laboratory (building No. 21) was turned on 31 July 1957 by Dr. Cyril H. Goulden, then Director of the Experimental Farms Service; a new poultry laying house (building No. 33), new beef cattle facility (building No. 40), and road paving were completed in 1958; and tenders were let in 1959 for construction of a greenhouse–headerhouse complex (building No. 53).

Site preparation for the office–laboratory required removal of the office erected in 1914 which, since 1949, had served as Jack Stothart's residence. Its new location, where it again served as a residence, was adjacent to the boardinghouse built in 1951. The new beef cattle facility was constructed on the newly acquired Talbot property, about 1 mile (1.6 km) distant from the main building site. Site preparation required demolition of the barns built by the previous owner, but the lowest tender received for the job was $5000. When the local fire department offered to do it at no charge—using a method that would provide excellent training for their volunteer firemen—Jack jumped at the chance. The money saved was subsequently used for construction of corrals.

The same year, 1958, saw the demolition of the large cattle barns built in 1912 on the main building site. These had not been occupied for several years and, with a new beef facility under construction, had no likelihood of future use. The contractor who undertook this task employed a novel technique for loosening nails cemented in position by years of rusting. He fixed dynamite charges throughout the roof and walls of the structure and their sequential detonation raised an immense pall of dust. When the dust cleared the structure, much to the surprise of most onlookers, appeared unchanged. However, the dynamite had served the intended purpose and the building came down in record time. The original site of this barn is now occupied by the farm workshop (building No. 52).

The sod-turning ceremony for the new office–laboratory was the main feature of the 50th anniversary celebrations for the station. The occasion was marked by a special issue of *The Lacombe Globe*, by station publication of a 50th anniversary pamphlet, and by a staff reunion for former employees. One ex-employee who could not attend was former Superintendent, Mr. F. H. Reed. However, his letter of regrets revealed an aspect of his background previously unknown to his staff. In the founding year of the Lacombe station, 1907, he was one of the five men appointed as an "agricultural representative" when that extension service was begun by the Ontario Department of Agriculture.

left
Opening of new office building in 1959.

below
The office staff in 1972: (clockwise) Mavis Kononoff, Marg Marshall, Avis Sayers, Mary Walushka, Bonnie Chalmers, and Bill Murray.

Morning activities included conducted tours of the premises and review of the research in progress. Music was provided during the buffet dinner by the Rimbey band and addresses were given by Dr. Andrew Stewart, President, University of Alberta, and Dr. Goulden before the latter officially announced the construction plans.

Lacombe had proposed that the building provide space to house staff of the Alberta Department of Agriculture. Integration of the extension function of the provincial government with the research function of the station appealed as a logical way to maximize the efforts of both resources. Informal discussions with provincial department officials proved highly encouraging and floor plans were drafted to accommodate this joint function. Those plans got short shrift at headquarters; building size and cost were cited as reasons for rejection, but Lacombe was reminded that extension was a provincial, not a federal, responsibility. Perhaps the proposal was simply ahead of its time, because the next major office–laboratory, built by the Department at a Maritimes location, did in fact incorporate the concept advanced by Lacombe in the mid-1950s.

The construction contracts in 1958 included $250 000 for the new office, $42 000 for the beef barn, $11 700 for the laying house, and $23 800 for road paving. No projects overran the budgets provided and the two livestock buildings were completed within the 12-week period specified in the contracts. Office construction was less rapid but the building was completed and in full use before the end of 1958. The inscription on the plaque unveiled at the official opening reads:

"Commemorating the 50th Anniversary of the Lacombe Experimental Farm. Sod turned on July 31, 1957 by C. H. Goulden, Ph.D., L.L.D., F.R.S.C., Director Experimental Farms Service, Ottawa, and G. E. DeLong, M.Sc., Superintendent of the Lacombe Experimental Farm 1946–1955. Office-laboratory officially opened and dedicated to agricultural research on March 26, 1959 by Col. The Honourable D. S. Harkness, G.M., B.A., Minister of Agriculture, Ottawa."

This new building substantially upgraded the accommodation and laboratory facilities for the existing staff and their research programs. It also provided office and laboratory facilities for the Plant Pathology Laboratory which, in 1955, was projected for transfer from Edmonton to Lacombe. This was viewed as an important addition to the station, as breeding for disease resistance was an integral component of the cereal and forage breeding programs.

Another new activity was breeding research with laboratory animals. Laboratory species, particularly mice, had several attributes of importance to studies in population genetics. Generations could be turned rapidly, at least four times a year; large populations could be maintained at minimal costs for feed, labor, and facilities; full control of environmental conditions presented no problems; and in reproductive characteristics (i.e., multiple births) they closely resembled pigs. The Lacombe proposal that the new office include two environmentally controlled small-animal laboratories for pilot studies in animal breeding was accepted and this station became the first Canadian research center to undertake such work.

The new office–laboratory also provided accommodation for computing and statistics. Lacombe in the early 1950s had initiated the research application of computer technology in Canada and the installation of card punching and sorting equipment in the new office in 1958 represented the first time such equipment had been installed outside Ottawa.

In the late 1950s, the Canada Department of Agriculture began an examination of the internal structure of its research program. The main arm of that research was the Experimental Farms Service but a second arm was the rapidly expanding Science Service. Its employees, unlike those of the Experimental Farms Service, were not expected to have any contact with the farming public. Their mandate was to conduct in-depth research free from any restraint concerning practical applications. Since work was not to be duplicated by the two services, this fostered the perception that employees of the Experimental Farms Service were not really scientists.

Amalgamation was one solution to the problems, real or perceived, resulting from this dual structure, and rumors that this might occur were confirmed by a memorandum sent on 12 September 1958 to the directors and superintendents of both services. When the official announcement came on 1 April 1959 the new unified organization was titled the Research Branch, the field units were called research stations, and the superintendents became directors.

The only aspect of reorganization that affected the Lacombe station was discontinuation of the illustration station work. With reorganization, this Division ceased to exist and all stations were closed. Lawrence Anderson, appointed supervisor at Lacombe in 1952, and his assistant, Stu Church, appointed in 1949, both transferred into the field crops program at Lacombe. Lease arrangements were concluded at the nine field locations then in operation at Acme, Castor, Metiskow, St. Paul, Bonnyville, Cheddarville, Leslieville, Evansburg, and Athabasca. The oldest of these was Cheddarville, the location where trials conducted during the late 1930s had first identified the importance of sulfur to legume crops grown on Grey Wooded soils.

Another change adopted after amalgamation was reorganization of the Lacombe program under three sections, crop management and soils under the direction of Henry Friesen, plant breeding under Don McFadden, and animal science under Howard Fredeen. In addition there was the Experimental Substation at Vegreville under direction of Dr. Ross Cairns.

Dr. Cyril Goulden was the first Director General of the new Research Branch. On his retirement in 1962, Dr. J. Ansel Anderson was named to this post. One major change in departmental policy during his 6 years as Director General was the introduction of collective bargaining for all civil servants; the legislation gave new meaning to labor relations by incorporating the right to strike as a legitimate part of the bargaining process. In preparation for the change, a position description had to be prepared for each employee and a new arm of administration was created at Ottawa to develop forms and procedural manuals. The actual work of position description, transferred to supervisors at each location, proved a prolonged and tedious task. Another major change before Dr. Anderson retired in 1968 was the introduction of management by objectives. This required reorganization of all projects into packages termed programs, each having its own specified goals, and several years elapsed before all the bugs were worked out of the new system.

The annual budgeting process for the Branch always posed a dilemma at headquarters. The sum of the individual needs of the Branch units invariably exceeded the total appropriation provided, and the rationalization employed in division of funds could never satisfy everyone. When funds were tight, thoughts of the larger units turned to predation. They knew their programs were of great importance and to them it seemed simple logic to recommend closure of small units, that the large might grow. Lacombe did not escape this examination but when Dr. Anderson, on his first visit to the station after becoming Director General, requested a "get-acquainted" meeting with the entire staff, none suspected the message he was to deliver. No time was wasted on preliminaries. Management, he explained, had decided that the Lacombe staff was too small to perform viable interdisciplinary research; it lacked library facilities; and its isolated location made difficult any meaningful interplay with the scientific community. For these reasons, the station would be closed. However, all employees would be given an opportunity to transfer, without loss of pay or position, to jobs elsewhere in the service.

His statement met with the silence of shocked disbelief. There had been no forewarning; the decision was delivered with finality, and there was no discussion. But before Dr. Anderson left, the Director requested that he and his senior scientists be given audience. The request was granted and, in a meeting extending well into the night, an attempt was made to counter the headquarters argument. Evidence was produced showing that Lacombe scientists had authored more scientific publications on average, and had achieved a broader degree of international recognition, than had employees at several substantially larger research centers. The staff argued that if these were valid criteria of scientific performance then perhaps the criticisms documented by headquarters should be viewed as virtues, not deficiencies. Dr. Anderson gave no answer that night, but subsequently he rescinded the plan for closure and gave strong support to further development of the Lacombe program.

One tangible result of this support was the designation of Lacombe as a center for statistical and computer service. The requirements for statistical analyses of data from the large animal breeding research programs of the station had far outstripped the equipment and machine methods pioneered by Lacombe in 1952. Starting in the late 1950s, all major analyses were performed at Ottawa using the new centralized computer installation administered by Statistical Research Service (SRS). By 1967, the requirements from Lacombe represented approximately three-quarters of all service work performed by the SRS facility and Lacombe proposed that a matching facility be developed at the station. Dr. Anderson agreed. He transferred Eva Reimer and Milton Weiss, the two people from SRS who had handled all Lacombe analyses, to the station in 1968, authorized a contract with CSS (Computer Systems of Canada) for rental of their Univac 1108 computer facility in Calgary, and authorized the installation of a computer terminal at Lacombe. The keypunch and sorter installed at Lacombe in 1958 completed the system and this station became the first Branch location outside Ottawa to possess an in-house computer system.

Use of the Calgary Univac began in mid-1968. For the first 6 months, Eva Reimer, Milton Weiss, and Howard Fredeen operated the computer directly, spending an average of 18 hours a week in Calgary for this purpose. Subsequently, a dedicated telephone line was installed and all data and programs were input through a terminal located at Lacombe.

The central function of this unit was to service the large computing needs at Lacombe, of which approximately 95% was generated by the animal science section. But another function was to establish the prototype for computer development at Branch locations, and Milton Weiss was charged with the responsibility of bringing other centers into the computer age. Using the Lacombe system as a model he promoted negotiations on behalf of other centers and in 1971 similar arrangements were concluded for several other stations, including Lethbridge.

The development of the computer center at Lacombe required facilities additional to those available in the office–laboratory built 10 years previously. The boardinghouse built in 1951 was vacant and, after an expenditure of $800 to convert the dining room to offices, the computer group and animal science section took occupancy in April 1968. Subsequently a fireproof annex was constructed for $1000 to house the terminal. This converted facility, quickly dubbed the “backhouse” by other staff members, has continued to this day as accommodation for the computer and most of the staff associated with livestock work.

Crop management and soils section

Weed control methods, both chemical and cultural, and soil fertility were the two major concerns of the crop management and soils section. Prior to 1959 there were three scientists in the section: Henry Friesen (1953–1977) as weed specialist and section head, Don Walker (1952–1981) as soil chemist, and Don Dew (1956–1981) in charge of tillage and crop management investigations. Stu Church (1949–1966) joined the group when work with illustration stations terminated in 1959, and with Doug McBeath (1962–1980) conducted work on plant nutrition. Long-time supervisors of plot work who are still on staff included Dick Gillespie (1950), Dave Friesen (1956), Gerry Doornenbal (1957), Bob Doyle (1958), and Fred Brook (1961). Others were John King (1962–1980), Orest Litwin (1965–1975), and Jim Chalmers (1974–1981).

Weed control Prior to 1960, the work with herbicides (mainly 2,4-D and MCPA) centered on the control of broad-leaved annual weeds in cereal crops. As the more common of these weeds came under control, others including the long-time pest wild oats increased in importance. Two herbicides (Avadex and Carbyne), discovered in the early 1960s, selectively controlled wild oats in wheat and barley and considerable research was devoted to these chemicals at Lacombe during the decade. Work also began in the late 1960s and early 1970s to evaluate mixtures of herbicides for control of wild oats and broad-leaved weeds. Research on the biology and control methods for perennial weeds such as Canada thistle included studies of cultural methods (such as tillage), systemic herbicides, and integrated cultural plus chemical methods.

The advent of rapeseed production in the mid-1960s required new approaches to chemical control of weeds in this broad-leaved crop. Experiments begun in 1968 identified several products specific for wild oat control and one, Treflan, that controlled wild oats plus a variety of broad-leaved weeds in this crop. Tests with all herbicide products were conducted with a wide range of crop species and crop varieties and at numerous off-station sites as well as the Lacombe station. The off-station tests had particular relevance in respect of local or unique weed problems.

above
Howard Armstrong, shop foreman (left), and Mike Susut.

below
Milton Weiss and Eva Reimer with the computer terminal installed in 1969.

Use of greenhouse and growth chamber facilities enabled scientists to continue their herbicide experiments year-round and to test the effects of factors such as light, temperature, and humidity on the tolerance of plants for various herbicide applications.

Henry Friesen was a leader in evaluating candidate (unlicensed) and licensed herbicides for control of weeds in cereal and oilseed crops. As a result of his rigorous and comprehensive approach to all his herbicide experiments, his findings were used by the chemical industry in submissions for licensing of their products and in the detailed label directions they provided for use and application techniques. Of singular importance was his use of radio-isotopes to study the uptake, translocation, and metabolism of specific herbicides by plant tissue. This work, fundamental to the design of new or improved products, attracted worldwide attention.

Cultural methods for weed control and changes in the physical structure of soil associated with various tillage methods or cropping sequences were the initial areas of investigation by Don Dew. At an early date, however, he became interested in the question of cost–benefit ratios associated with various weed control procedures. It was a simple matter to determine the costs associated with spraying or tillage, but much less obvious was the value of the yield improvement that resulted from such operations.

His first step was to determine the relationship between crop yield and the weed population, by growing cereal crops in competition with controlled levels of weed population—a process described by his colleagues as "cultural experiments with weeds." His initial work dealt with wild oats but, following a province-wide survey of weed problems in 1971, it was expanded to broad-leaved annual weeds.

The end result was a mathematical description of the reduction in crop yield resulting from weed competition. Using the index he provided, a producer could estimate the cost (in terms of potential yield reduction) of the weeds present in his field. Next he could calculate the benefit (yield improvement) that would result from application of appropriate herbicides. Supplementing these cost–benefit estimates with information on the actual cost of herbicide application, he would have a clear picture of the economic feasibility of chemical control. This theoretical approach, published in the scientific literature after thorough empirical testing, aroused international interest.

Soils Don Walker's early work concentrated on the question of optimum levels of various plant nutrients, particularly nitrogen and potassium, for use with cereal and forage crops grown in the varied soil-climatic zones served by the Lacombe station. All his experiments were designed to permit economic analyses to identify the optimum levels, fertilizer combinations, and times of application for each crop. His results were incorporated in provincial soil fertility recommendations.

Sulfur deficiency on Grey Wooded soils also claimed Don's early attention but subsequently he demonstrated that serious problems of sulfur deficiency also existed on peat and Degraded Black soils. He identified an area bounded by Bentley, Bluffton, and Rocky Mountain House as being deficient in selenium, a deficiency later shown to cause white muscle disease of cattle and sheep. He demonstrated that the uptake of this element by plants was impeded by sulfur applied as fertilizer to improve the productivity of these sulfur-deficient soils.

Don developed a broad network of field trials which provided him with an unique knowledge of the immense variety of micronutrient deficiencies that existed throughout the region. Each problem identified in the field was followed through by chemical analyses in the laboratory, then by controlled tests in growth chambers to identify appropriate corrective measures. The knowledge gained from this thorough approach made his advice of singular value to farmers throughout the region.

Doug McBeath (1962–1980), whose initial work centered on the nutrient requirements of perennial forage crops, demonstrated that grass–legume mixtures grown in a rotation on Grey Wooded soils greatly benefited subsequent cereal crops by a gradual release of the nitrogen they contained. Later, in cooperative studies with scientists at the University of Alberta, he developed mathematical models relating yield of barley to applications of fertilizer nitrogen and phosphorus, and to soil-test values for nitrate nitrogen and extractable phosphorus. Their results suggested several ways of improving fertilizer recommendations, namely, basing nitrogen requirements on soil samples taken to 30 cm rather than 15 cm deep, adjusting phosphorus applications according to levels of extractable soil phosphorus, adjusting nitrogen for variation in soil moisture levels, and modifying the application rates for both nitrogen and phosphorus according to prices of fertilizers and barley.

Doug also provided considerable new information on fertility requirements of forage crops, particularly for long-term stands of bromegrass grown for hay or pasture. He found that bromegrass had a very high requirement for nitrogen which increased with stand age. He also demonstrated that phosphorus could be applied in relatively large amounts at time of seeding and would supply the needs of forage crops for several years. In addition, pure stands of bromegrass, when adequately fertilized with nitrogen and phosphorus, consistently produced higher yields than pure stands of alfalfa. Proper fertilization also permitted high sustained yields from bromegrass over many years without frequent stand renewal. This work was of special significance to cattlemen in the Alberta parklands as bromegrass is the major forage species grown.

Vegreville substation The first activity of Ross Cairns (1957–1979) as officer-in-charge was development of the unit itself. When facilities were in place he initiated research on depth of tillage (plowing), crop rotations, and the use of commercial fertilizers. Then he extended his work to Solonetzic soils throughout the eastern half of the province, choosing several off-station sites representative of the Brown, Dark Brown, and Black soil zones.

The wisdom of this extension of work was soon apparent. Crop yield on the black Solonetzic soil of Vegreville responded dramatically to tillage that disrupted the impervious B horizon and reintroduced to the topsoil layers the calcium carbonate concentrated in the C horizon through centuries of leaching. The greatest benefit was provided by plowing deeper than 20 inches (50 cm). Impressive, though less dramatic, yield increases were also recorded for deep plowing at the off-station sites, but the degree and persistence of this improvement was highly variable, particularly with cereal crops. Some soils responded to fertilizer without deep plowing whereas other soils required both deep plowing and fertilizer.

Yield data obtained from eight Solonetzic soil locations—Chipman, Coronation, Fleet, Lamont, Leduc, Legal, Vegreville, and Viking—indicated a variation in yield responses to deep plowing ranging in comparative value from $3 to $20 per unit area. These data, coupled with the evidence that the effect of deep plowing had not dissipated after 5 years (13 years at Vegreville) provided a basis for estimating the cost–benefit ratios for this tillage procedure.

Long-time staff members (still present) associated with this work at Vegreville were Irvin Cowan (1952), who came from Lacombe, Nestor Zubreski (1955), Mike Sturmay (1956), Ernie Gizowski (1966), and Jean Erickson (1971).

Plant breeding section

Prior to Branch reorganization in 1959, the cereal crops breeding program was headed by Don McFadden. His first assistant, Earl Lowe, accepted a position with Alberta Agriculture in 1955 and Martin Kaufmann was appointed to that position in early 1956. Bill Doran (1953) was in charge of forage crops and H. T. Allen (1947) directed the horticultural work. In 1959, all work with cereals, forages, and horticulture was amalgamated, with Don McFadden as head of the new plant breeding section; plant pathology was added in 1962. When Don retired in 1971 his successor was Martin Kaufmann. Among the senior personnel who contributed much to the cereal and forage work

above left
Plot harvesting crew, 1972: (L to R). Don Dew and Dave Friesen (kneeling): Ron Thompson and Lawrence Christiansen (standing).

below left
Soil scientist Don Walker and his assistant Gerry Doornenbal (1972).

above right
Vegreville substation.

below right
Plow designed for deep plowing of Solonetzic soil at Vegreville.

right
Plant pathologists Lu Piening (left) and Bill Berkenkamp with assistants Joan Meeres (left) and Marg Watts

below
Harvey Allen (left) with Ernie Bollhorn evaluating potatoes

through the years were Bud Davidson (1953–1971) and Ron Spink (1957–present) in forages; Murray Forbes (1950–present), Jack Van der Wal (1953–1974), Frank Brewster (1958–1974), Jack Deck (1959–present), Bill Stewart (1962–1980), and Bob Pocock (1976–1982) in cereals; and Joan Meeres (1966–present) in plant pathology. Horticultural work was under the supervision of Mike Bachinsky (1957–1958), Pete Wynia (1958–1969), and Ernie Bollhorn (1971-1982). These three men were also responsible for grounds maintenance and through their efforts the beauty of the premises continued in the fine tradition established by Mr. Hutton.

Cereal breeding The northern wheat breeding project, begun in 1949, was headed by Don McFadden until 1956 when Martin Kaufmann took over. Park wheat, a cross of (Midas × Cadet) × Thatcher, was a product of this program. It was licensed and distributed to seed growers in 1963. The project was terminated in 1964 and attention was directed toward barley and oats in anticipation of increased emphasis on feed grains for livestock production in central Alberta. Barley is now the main crop of the area and comprises more than 5 million acres (2 million ha) of the cropland seeded annually in Alberta.

Martin Kaufmann, in 1960, initiated a single-seed descent method of breeding with oats. Initially termed the random method, this procedure in cereal breeding resembles traditional methods only in the initial crossing of selected parents and production of the first generation. From this point onward until true breeding is established, each generation is propagated from single seeds of the previous generation. In the sixth or seventh generation the multitudes of random lines are increased and yield tests are conducted.

This was a highly unconventional method. It broke sharply from traditional cereal breeding procedures and many plant breeders insisted it would not work. Criticism still persists but the results, four new oat varieties, speak for themselves. The first oat variety developed by this method was named Random; it was licensed in 1971. Subsequently the oat varieties Cavell (1975), Athabasca (1978), and Cascade (1979) were licensed. Each of these varieties combined high yield with early maturity and resistance to lodging.

The oat breeding program was taken over by Harvey Allen in 1972 and Martin Kaufmann turned his attention to barley breeding. With this crop, he continued to apply his single-seed descent procedure in a breeding program that emphasized yield and resistance to scald, net blotch, and loose smut along with desired agronomic characteristics such as early maturity and lodging resistance. One line, BT 618, developed in this program was licensed in 1982 under the name Diamond in recognition of the 75th anniversary of the Lacombe Research Station.

Varieties developed at Lacombe have been well accepted by farmers in central and northern Alberta. Park wheat yields well and is earlier maturing and easier to thresh than Thatcher and Neepawa. It is grown on about 1 million acres (400 000 ha) in Alberta annually. Random oats was grown on an estimated 350 000 acres (140 000 ha) in Alberta in 1981. Athabasca, an early-maturing oat, is becoming popular in the Peace River area of Alberta and British Columbia. Cascade, the highest yielding oat in Alberta, was increased by many seed growers in 1981 and is expected to occupy a high percentage of the oat crop area in the future.

Random oats, because of its relatively short straw, good lodging resistance, and high yield, has been used extensively as a parent in other oat breeding programs in Canada.

Testing of licensed varieties and new introductions has remained an integral part of the plant program at Lacombe. Results of these tests, conducted at a number of locations throughout the area served by the Lacombe station, have contributed substantially to the annual varietal recommendations of the cereal, forage, and horticultural advisory committees of Alberta. These tests have also identified foreign introductions of value under Alberta conditions. One example was Pendek, an oat variety introduced from Holland. This was licensed in 1963 on the basis of recommendations from Lacombe.

In 1957, Martin Kaufmann and Don McFadden began studies on the relevance of seed size to germination and development of the barley plant. The results indicated that seed size was an important source of variation in rate of growth and tillering and thus required consideration if selection on a single-plant basis in early generations was to prove effective. They also investigated the importance of the seed source. Yield differences ranging up to 15% were recorded between two genetically identical seed stocks of Conquest barley produced at Lacombe and Brandon when tested at 15 locations across the prairies of Canada and the USA. This work on seed size and seed source was part of the exploratory studies conducted in attempting to define selection indexes for use in the cereal breeding programs.

Forage crops After the death of Buck Stelfox in 1957, his work was continued by Bill Doran (1953–1961) and Hans Baenziger (1958–1968). Bill Doran took particular interest in the pasture program and completed it in 1961 with Don Walker and Gordon Bowman. Hans Baenziger began a timothy breeding project, cooperated with the Beaverlodge station in development of alsike clover varieties, conducted studies on low-coumarin varieties of sweetclover, and continued the red clover breeding program begun by Buck Stelfox. One of his special interests was the cytology of crested wheatgrass; he discovered that the presence of extra chromosomes lowered fertility and seed yields. He transferred to Ottawa in 1968 in an exchange move that brought Len Folkins (1968–1980) to Lacombe to take charge of the forage program.

Bill Berkenkamp, a plant pathologist, provided a real boost to the red clover breeding project when he joined the staff in 1962. He began his work with a study of *Kabatiella caulivora*, the fungus causing northern anthracnose of red clover. Prior to this time, the selection of resistant red clover plants had been a slow, difficult process and, although excellent material had been developed, the lack of reliable procedures for inoculating plants with the disease slowed progress in the critical screening procedures. Bill overcame this problem by developing an improved inoculum and, in 1973, a northern anthracnose-resistant variety of red clover was licensed for distribution under the name Norlac. This culminated work begun in 1947 by Buck Stelfox and continued by Bill Doran, Hans Baenziger, Len Folkins, and Bill Berkenkamp.

Bill's responsibilities included evaluation of various varieties of rape and mustard, but his central interest was with diseases of these crops. From disease surveys, he determined the distribution and causal agents for root rot of rape and, in this process, found that treatment of this crop with herbicides for weed control increased the severity of some diseases. He also directed disease surveys of legumes and grasses in central and northern Alberta, as part of the national crop disease loss assessment program, to determine the distribution and severity of diseases and the crop losses involved. In this process he identified several diseases of forage legumes previously unknown in Western Canada.

Cereal pathology The cereal pathology program began at Lacombe in 1965 when Lu Piening returned from study leave. His first research focused on the physiological nature of barley leaf resistance to net blotch, a major leaf disease of this crop. He demonstrated that resistant barley cultivars produced compounds that inhibited fungal growth while susceptible cultivars lacked this ability.

In the early 1970s attention was turned to common root rot of wheat and barley. A prairie-wide survey of root rot in barley coordinated from Lacombe from 1969 to 1972 indicated that yield losses averaged 11%. This loss was considered sufficiently serious that additional research was started. One approach taken in 1976 was evaluation of chemical control procedures. Nuarimol, one product tested, demonstrated sufficent potential that its producers have recently submitted data, including that from Lacombe, to the regulatory authorities in Ottawa for the purpose of licensing this product for commercial use. A later approach in 1978 was to investigate the influence of agronomic practices on root rot infections and associated yield losses. Beneficial effects were obtained by seeding shallow, reducing plant density, plowing deeper, and adjusting the time of seeding and size of seed used. Greater benefits, however, were achieved by applying more phosphorus or potash to stubble-sown barley. Probably the most striking reduction of root rot appeared on barley sown after bromegrass in a rotation.

An unusual effect of a common plant disease was identified in 1972 when five steers died on a local farm. The direct cause was high nitrate in winter rye that had been severely infected with leaf rust. Repeated inoculation of rye in the greenhouse that year showed that plants inoculated with the disease always developed lethal levels of nitrate. An unusual leaf spot of sunflowers, which decimated sunflowers in the Lacombe area in this same year, was found to be caused by a bacterium previously not reported in Canada.

Horticulture The horticultural breeding program under Harvey Allen resulted in two licensed tomato varieties, Rocket in 1967 and Booster in 1971. Early maturity was the hallmark of both varieties and they received wide acceptance throughout the prairie region. These were not the first products from the horticultural breeding program at Lacombe—that honor belonged to a U.S. Department of Agriculture seedling introduced by George DeLong in 1942 and released as the variety Canus in 1946—nor were they the last. Parkland, an apple released in 1979, was a Lacombe selection from among 6000 seedlings received for testing in 1952 under the auspices of the prairie cooperative fruit breeding project. This, the final product from breeding and selection with horticultural crops, occurred 7 years after the main horticultural program was closed and Harvey had transferred his attention to oat breeding.

Animal science section

Howard Fredeen was appointed head of the animal science section 1955. As animal breeding work expanded, the scientific staff increased with appointment of Gordon Bowman (1952–1962), Jack Newman (1955–present), and Huib Doornenbal (1956–present). All three subsequently took educational leave for postgraduate studies during the period 1957–1961. Archie Martin was appointed in 1964 and Milton Weiss (1956–present) and Eva Reimer (1955–1982) joined the section in 1968 when animal science, as the main user of statistics and computing, was assigned responsibility for developing this area of activity. The scientific staff in animal genetics was increased in 1967 by appointment of Richard Frankham from Australia, but he left after 18 months to pursue further education. Alan Sather, a native Albertan and a specialist in swine breeding, joined the staff in 1974. Several postdoctorate fellows, and a number of visiting scientists, added substantially to the scientific expertise of the section during the period 1968–1976.

Two other activities added to animal science during the 1970s were veterinary science and economics. John Bradley (1971–1977) was seconded to Lacombe in 1971 to initiate research on methods for controlling calf scours. The practical and highly effective management procedures he developed were adopted throughout Western Canada. Bob Jolly (1975–1979) was appointed in 1975 to develop economic models for cow–calf and feedlot operations. Later he extended his studies to pigs and various aspects of crop production.

Beef cattle The high–low beef breeding study and a companion study on growth and development of beef cattle, begun at Lacombe in 1949 and extended as cooperative projects with Scott, Indian Head, and Brandon in 1952, had been intended as pilot studies for performance selection programs. The results obtained provided much of the input to the national record of performance program (beef) when that was designed in 1957 and also paved the way for a controlled selection experiment based on postweaning growth. This project, designed at Lacombe, required a large breeding population and once again cooperative arrangements were made with Brandon, Indian Head, and Scott. Melita, a substation of Brandon, was also involved. Howard Fredeen was project leader and the program was in place for the 1957 breeding season with a total breeding herd of 500 Shorthorn cows. Cows at the five locations shared a common breeding background but the operation, designed as two closed-herd replicates, was later consolidated at two locations, Brandon and Lacombe. Ed Linton was beef herdsman at Lacombe until 1963 and his successor was James Asher who came to Lacombe from Scott, Sask., in 1960.

This was the largest beef cattle selection program ever undertaken in the world and the genetic information it provided over five generations represented the first clear evidence of the efficacy of consistent performance selection with this species. The increase in yearling weight of bulls averaged 10 kg per year, of which approximately 45% resulted from genetic change. Selection for desirable characteristics did not have any undersirable side-effects, and the improvement represented an increase in the growth rate of lean tissue.

The Shorthorn selection project was suspended in 1970 so that the breeding herd could be used to produce crosses for evaluation of new beef breeds being imported from Europe. Prior to 1950 only three breeds, the Hereford, Angus, and Shorthorn, were recognized as beef breeds in Canada. The Charolais, introduced early in the 1950s by some enterprising Canadian cattlemen, came to this country from the United States as animal health regulations prevented direct importation from Europe. In 1964, development started on a maximum-security health inspection and quarantine facility for cattle entering Canada and 2 years later Jack Stothart was commissioned to visit Europe, evaluate the cattle breeds in terms of beef potential under Canadian conditions, and choose representative breeding stock of the best breed for import by the Department. His first choice, the Swiss Simmental, was not available that year. In their stead, Jack selected four bulls and eight heifers of the French Simmental (Pie Rouge). Prior to their arrival, Lacombe documented a comprehensive program for evaluation of growth and carcass characteristics of first-generation crossbred (F_1) steers and of the lifetime reproductive performance of F_1 heifers produced by mating bulls of the new breeds with the three British breeds available in Canada. Jack Newman also developed contracts with 20 producers in Alberta to use their Hereford and Angus cow herds for production of the F_1 crosses for this study.

The Simmental imports, after clearing quarantine in April 1968, were delivered to Lacombe and approximately 500 Angus, Hereford, and Shorthorn cows were bred to Charolais and Simmental sires that summer to initiate the study. Meanwhile, Jack Stothart had returned to Europe to select Limousin breeding stock for the project and Lacombe proposed a collaborative evaluation of the reproductive performance of crossbred females sired by Charolais, Limousin, and Simmental bulls in the contrasting environments of Brandon, Lacombe, and Manyberries. This foreign cattle breed evaluation program (FCBE) proposal was accepted; Brandon and Lacombe undertook production of the F_1 crosses, John Lawson of Manyberries arranged for purchase of Hereford × Angus heifers to serve as a control population, and the project was launched in June 1970, by transfer of yearling F_1 females to Brandon and Manyberries. A herd of 1150 females was assembled over 3 years and the first progeny of those females were calved in the spring of 1971. In preparation for herd buildup at Brandon, that station's Shorthorn herd was transferred to Lacombe in 1970 and the Limousin breeding herd followed in 1971.

From its inception, this program has been directed by a committee comprising Howard Fredeen (Chairman), John Lawson of Manyberries, Jack Newman and Milton Weiss of Lacombe, and Gunther

The cattle crew and part of the 1000-head cattle herd in 1972: Garry Salmon (left), Russ Burton, Jack Newman, Carol McKerracher, Darrel Neal, and Neil Cunningham.

Rahnefeld of Brandon. Brandon and Manyberries maintained and managed the F_1 cow herds and Lacombe developed and maintained the data bank and evaluated the feedlot performance and carcasses of calves produced at Manyberries. All calves produced after the heifer production year were three-way crosses sired by Charolais, Chianina, Limousin, and Simmental bulls. The Chianina breed had been imported from Italy in 1970, with Jack Stothart again serving as selector for the Department.

After 1972, the Shorthorn herd at Lacombe was employed by Jack Newman for evaluating crosses of several other "exotic" breeds, including Blonde d'Aquitaine, Gelbvieh, Maine-Anjou, Marchigiana, Murray Grey, Pinzgauer, and Romagnola. Crosses produced by Hereford cows mated with South Devon, Maine-Anjou, and Simmental sires were also evaluated in a cooperative study with Palmer Ranch of Hillspring, Alta. Evaluation criteria for all this work included calving ease, birth weight, weaning weight, feedlot performance, and carcass traits.

Cattle inventories grew during this period. The breeding herd increased to 600 head of Shorthorn, Simmental, Limousin, and Chianina cows, with feedlot and carcass evaluation performed on approximately 1200 head annually. To accommodate these cattle the Kasha property was purchased in 1965, additional pasture was leased for summer grazing, and feedlot facilities were expanded during the period 1970–1972. Jim Asher retired prior to the period of herd expansion and Glen Rafuse, his successor in 1969, introduced the use of saddle horses to the cattle operations, designed efficient corral and weighing facilities, and supervised the transition from pasture breeding to artificial insemination. One of the "cowboys" he trained, Adam Schonheiter (1960–1976), who started employment at Lacombe as a poultryman, took over as head herdsman when Glen resigned in 1972. Ian Turnbull (1969–present), a technician in the beef research program who had a key role in the contractural production of F_1 females for the FCBE program, became herdsman when Adam retired in 1976. Other long-term cattle herdsmen were John Van der Zee (1942–1968) who, like Adam, had worked with poultry, Lawrence Christianson (1972–1981), and Darrel Neal (1970–present).

Swine Completion of the Lacombe breeding project was the major activity with swine during the late 1950s. Based on the results obtained in crossbreeding (field tests) and purebreeding (the satellite herds at Scott, Indian Head, Olds, and Vermilion), the advisory committee recommended release of the breed in 1957. Contract multiplier herds were established with Bill Allan of Bentley and Hugh Thompson of Olds, complete pedigree records were submitted to Canadian National Livestock Records, genetic purity for white color was established, and a system of selective registration featuring minimum standards for growth rate, feed efficiency, and carcass merit was developed by Jack Stothart and Howard Fredeen. All the color testing was made possible by the cooperation of Curt Smith, Wetaskiwin, owner of a large Berkshire herd.

The first public exhibition of the Lacombe was made at the National Swine Show held in Brandon 1 July 1957. This was followed on 7 October 1957 by a public draw to determine the recipients of the first 50 boars released. There were 823 applications and the successful applicants were distributed from British Columbia to Ontario. Breeding groups were released annually for the next 3 years and, by 1960, 462 breeding females had been placed in the hands of private breeders. The inaugural meeting of the Canadian Lacombe Breeders Association was held at Lacombe on 13–14 August 1959. The constitution, including rules and regulations governing selective registration, ratified by the meeting, received Ministerial approval the following month. Howard Fredeen was named secretary-treasurer, a role he was to fill for the next 11 years.

Selective registration, a procedure unique to the Lacombe breed, required that four pigs from each litter be tested under the Canadian Advanced Registry policy and slaughtered for carcass evaluation. Despite this handicap the breed expanded rapidly and by 1964 registration papers had been issued for 10 600 pigs. The 2326 Lacombes registered that year comprised 11% of all pedigree certificates issued for purebred swine in Canada. Registered Lacombes had also been exported to the United States, Japan, United Kingdom, Germany, Italy, and Soviet Union. Official herd books, required for export trade, were prepared by the secretary and published in 1962 and 1965.

Results obtained in the 4 years of field testing (1954–1957) supervised by Gordon Bowman demonstrated that the Lacombe produced carcasses equivalent in merit to the Yorkshire and had a 10% advantage in weaning weight and postweaning growth rate. This growth rate advantage has characterized the Canadian performance of the breed and its crosses since its release in 1959 and has merited comment in reports from controlled tests conducted by various importing countries. One report from the

Heifers
Angus bulls.. your best investment!
Angus cows are a good, sound investment!
Angus heifers sound investment for the future

above
Bev Harrington, head swine herdsman for 44 years, and his dog Scottie with a "color test" litter the sow proved heterozygous and was culled

below
Draw for Canada-wide distribution of the first Lacombe breeding groups in 1959. Jack Stothart holds the container of applications while the draw is made by the mayor of Lacombe, Alex Ellis; Howard Fredeen observes and Lorraine Malmas records.

United Kingdom made special mention of the superiority of Lacombes in ease of handling, lean tissue growth rate, and in grazing ability of the breeding females. The latter may have reflected the pasture management to which all pregnant females were subjected throughout the period of breed development.

The apparent spontaneous recovery of the Lacombe herd from early herd health problems was the subject of much speculation among animal health authorities. Immediately prior to breed release they recommended a special test to determine whether the Lacombe herd was free from health problems or whether the animals were merely resistant carriers. Day-old pigs, delivered by hysterectomy, were brought into the herd, fostered on newly farrowed sows, slaughtered at 90 kg liveweight, and subjected to thorough post-mortem examination. No evidence of any nasal or lung infections was found and the herd received a clean bill of health. In the years following release many observers have commented on the apparent resistance of Lacombes to respiratory problems. Whether this reflected some degree of natural selection imposed by the herd health conditions prevailing during those early years of breed formation has never been determined.

In 1960, after transfer to Brandon of the remaining inbred Yorkshire line, Lacombe initiated a large-scale study to demonstrate and evaluate the use of performance selection based on growth rate and minimum fat. Fat was measured on the live animal by use of a new technique, the scalpel probe. When the study was terminated after 11 generations, comparisons with an unselected control population indicated a 10% reduction in age at slaughter, an improved index (less fat) equivalent to $3.04 per pig, and a reduction in feed costs of $3.13 per pig.

The first Canadian research on leg weakness in pigs was initiated by Lacombe in 1969. The results showed that the incidence and severity of joint damage increased with increasing duration of the feedlot confinement period. It also showed that a period of exercise on pasture following completion of Record of Performance test promoted repair of damaged joints

above
Directors of the Canadian Lacombe Breeders Association at their inaugural meeting in 1959. Paul Kernaleguen (at left) and Maurice Weir (Saskatchewan); Howard Fredeen; Clayton Tolton and Henry Riese (Manitoba); Dan Smith, George Matejka, and Philip Rock (Alberta); and Wilbur Turnbull (Ontario).

above
George Op den Dries (swine herdsman) and his assistants Bob Reiter, Ed Chalmers, and Lawrence Christianson in 1972.

opposite page
The small animal laboratory with Ev Gilmar and her assistants John Stuivenberg (right) and John Tymstra.

and this management procedure was subsequently adopted as a standard practice by the national testing program. Research on leg weakness is now conducted at several centers in Canada, most of which have adopted the objective criteria of cartilage and joint damage developed at Lacombe.

From 1917, when Mr. Hutton undertook "the most ambitious swine breeding program ever attempted in Canada," the Lacombe station has been at the forefront in research with this class of stock. Its reputation grew under Happy Wilson and, with designation of Lacombe as an animal breeding center, the size of herd devoted to genetic studies grew to exceed that of any other research center in Canada. This fact, coupled with the emphasis given to solving practical problems in animal breeding, has given Lacombe a singularly important role in the evolution of the national swine breeding program.

Among those who were involved in the development of this program, particular credit is due Bev Harrington, senior swine herdsman from 1927 to 1970. He combined thorough and exacting record keeping with a high degree of expertise in husbandry and management. His vast knowledge of practical pig production was legendary among Alberta pig producers. Those who worked with him through these years included Bill Anderson (1928–1952), Don Hartle (1947–1962), John Tymstra (1956–1973), John de Vries (1950–1963), Ed Chalmers (1962–1982), and George Op des Dries (1955–present). George became head herdsman when Bev retired and his present staff includes Mitch Thevenaz (1972), Bonnie Hunt (1974), and Bill Sage (1965).

Selection studies with poultry and laboratory animals A poultry selection study was begun in 1955 with a population of 1000 laying hens. Facilities were expanded to accommodate incubation, brooding, and rearing, and a modern laying house with automated feeding and cleaning was constructed in 1959. Predation of pullets and cockerels from the range, believed due to two-legged predators, was a continual problem and led in 1959 to construction of a substantial link-mesh fence around the range area.

The selection study sought to determine whether the annual rate of genetic progress for egg production could be improved by early selection (production to 250 days of age) without compromising genetic gains for lifetime (500-day) production or other aspects of reproductive performance. Sixteen generations of selection produced substantial genetic progress in egg production during the "part-period," but much of this resulted from a steady decrease in age at sexual maturity and the change in total lifetime production was less impressive. This information on the potential limitations of part-record selection programs was valuable in designing selection programs for other livestock species.

Jim West guided this program until his retirement in 1969. Among his staff during these years were Alan Smith (1950–1960), Isaac Friesen (1955–1976), John Van der Zee, and Adam Schonheiter. The latter two moved to the beef unit when poultry work was discontinued in 1972.

The small-animals laboratory facilities constructed in 1958 were not populated until Jack Newman returned from postgraduate studies in 1960. At that time pilot studies with mice were begun to clarify for swine breeders the consequences of selection within closed herds, the latter being a procedure highly recommended as a means for controlling herd health. Many of the lines produced in the course of these studies were characterized by a brief life: they could not withstand intense inbreeding. Others survived for long periods, some in excess of 80 generations, but their responses to selection generally began to diminish after 25 generations. Both vigor and selection responses were improved by increasing population size and both were revitalized by line crosses. All the results were in accordance with genetic theory.

Senior technicians involved with this project included Jim Barr (1959–1970), John Stuivenberg (1957–1973), Ev Gilmar (1965–1974), and Dawn Sumner (1973), who is currently the technician in charge.

Carcass research The initial purpose of carcass research, begun in 1952 as part of the animal breeding program, was to develop objective techniques for appraisal of potential carcass merit in live animals. Studies involving radiography, begun in 1955, were expanded in 1957 when Leon Jarmoluk (1957–1982) joined the staff as X-ray technician. This work established radiography as an accurate and valid technique for measurement of both length and fat on the 90-kg live pig, but the work was terminated in 1960 when carcass length

had declined in importance in grading and other work at Lacombe had identified the scalpel-probe as a simpler and equally valid technique for measuring fat. Although the X-ray techniques developed by Leon Jarmoluk were not used in actual pig selection at the station, the details were published by the Kodak Company and the work continued to attract international attention long after it was discontinued at Lacombe.

Most of the techniques for carcass evaluation of the live animal that were investigated at Lacombe emphasized the measurement of subcutaneous fat, but two were specifically designed to measure total lean content. One was the EMME, a complex electronic device that utilized the difference in electrical conductivity between fat and lean to estimate total lean content of the live pig. This project received financial support from the Canadian Pork Council. The other technique used the potassium content of the body as an indicator of lean body mass, with potassium content estimated by quantitative measurement of a natural isotope, potassium-40 (K_{40}). A K_{40} counter for beef cattle was provided by Tom Eggerston of Lousana, Alta. Results obtained from 1973 to 1975 showed that both techniques could predict lean content but the high initial cost of both units, and maintenance problems with the electronic equipment, proved to be strong deterrents to their use in animal breeding programs.

During the early years of hog carcass research, data were limited to the linear measurements specified by the national testing program (Advanced Registry). By 1960, these data had been augmented by measurements of tissue composition of specified carcass cross-sections. The photographic techniques developed for this purpose by Leon Jarmoluk received worldwide attention when published in 1962. The next step was to initiate procedures for complete carcass dissection. These were in place by 1961 and the initial data obtained provided the carcass prediction equations adopted by the national pig testing program in 1962. They also provided the first critical evaluation of the Canadian hog grading system in 1964. This led to a series of studies in cooperation with the Department's Production and Marketing Branch, the Canadian Swine Council, and the Canadian Meat Packers Council of which the most ambitious was a Canada-wide carcass cutout study in 1967. Designed and analyzed by Lacombe, the results enabled Howard Fredeen to develop the indexing procedure that was adopted as the new system for hog carcass grading on 30 December 1968.

During this period, Archie Martin (1964–present) initiated studies on pH, moisture retention, texture, color, shear force, fatty acid composition, and other quality attributes of pork. With technical assistance from Leon Jarmoluk and Bea Braithwaite (1962–1978) he developed the cooking techniques, taste panel procedures, and consumer acceptance studies required to relate these objective measurements of quality with sensory evaluation of the product. Sex taint in pork received special attention for several years, with emphasis on developing techniques for taint detection in the hot carcass and consumer studies to evaluate acceptability of product from boars, gilts, and barrows. In the course of these studies, Leon Jarmoluk perfected a reliable hot-iron technique for taint detection which was subsequently adopted for use in Canada and several European countries.

Huib Doornenbal's initial work at Lacombe (1957–1958) dealt with anemia in baby pigs. His results with injectable iron compounds, then new on the market, helped to shape the future of these products. On his return from graduate studies in 1962 he began studies on growth and development of the pig. From chemical analyses of the complete carcass, he demonstrated that the lean-to-fat ratio of the pig remained fairly constant up to weights of 125 kg, well above the weight (90 kg) previously considered as the start of the fattening phase of pig development. Subsequent work on mineral content of the carcass contributed to knowledge of the role of selenium in pig diets. Charlie Crosby (1965–1972) and Gordon McLachlan (1963–1978) provided strong technical support for these studies.

In 1966, Howard Fredeen and Archie Martin extended their carcass dissection and meat quality studies to beef cattle. As with pigs, the dissection work was done in the Red Deer plant of Intercontinental Packers, with technical assistance from Leon Jarmoluk and Keith Muir (1964–1975). Included in the beef work was the study of changes in beef quality associated with length of the carcass aging period. In 1968, with financial assistance from the Alberta Department of Agriculture and the Western Stock Growers Association, the work was broadened to include examination of alternative beef carcass grading systems. Based on this study, Lacombe prepared a proposal for revising the grade standards which culminated in the new national beef carcass grading system adopted in September 1972.

Work on PSE (pale, soft, exudative) pork began in 1969 and special pig breeds, including the Pietrain, were introduced in 1971 for use in this study. Results showed that this particular problem with pork quality occurred only with certain breeds, and quality was not compromised when selection for increased lean was based on lean tissue growth rate. Techniques for predicting bacon quality were investigated during the early 1970s with financial support from the Alberta Hog Producers Marketing Board and the Alberta Department of Agriculture. Backfat thickness was found to be the best predictor and the correlation between bacon quality and carcass index (commercial grade) was high and positive.

Studies with youthful beef carcasses established that the conventional aging period could be substantially reduced (to 6 days) without compromising the degree of tenderness imparted by this process. In these areas of work, valuable technical support was provided by Greg McAndrews (1971-1977) and Patti Jo L'Hirondelle (1973-1980). Ed Martin, seconded by Lethbridge for a brief period in 1969 to assist in beef carcass work, was another technician who contributed greatly to the esprit de corps of the meats research group.

Through these years of carcass research, all dissection work was performed in a commercial slaughter plant. A long-standing proposal to build the required research facility at the station was approved in 1970, but approval was suspended before construction began. In 1972, a Departmental survey of Canadian meats research identified 22 centers with active programs. It also reported that 25% of all scientific papers published on meats during the previous 5 years had been contributed by Lacombe. This revived interest in developing a facility at Lacombe. Building plans were redeveloped and a new professional in meats science research, Les Jeremiah, joined the staff in February 1975. He expanded the work on aging of beef in coolers and initiated studies on short- and long-term storage procedures for fresh and cured pork products.

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CHAPTER 8

New People — New Directions, 1976 to 1982

Jack Stothart retired in 1976 after 44 years in the service of Canadian agriculture. The occasion was marked by a farewell banquet with many prominent agriculturists, including several who had served provincially or nationally as ministers or deputy ministers of agriculture, among the 350 guests. Agriculture Canada's Minister, Hon. Eugene Whelan, who toured the station prior to the banquet, expressed astonishment at the modesty of the buildings, saying "I had visualized an elaborate complex to go with your international reputation for excellence and instead I find it no different from a well-equipped private farm."

During Jack's tenure the total staff increased from 75 to 100 and the number of scientists rose from 8 to 20. Compared with other Branch stations, this was a relatively small unit but the staff was highly productive, with 282 scientific papers and more than 500 technical reports and bulletins published during the period. The administrative load increased in a corresponding fashion but for many years this was carried by very few people. Among those who gave long service in office administration and general farm management were Rose Miles (1961–1971), Marge Marshall (1969–present), and Mary Walushka (1972–present) in the office; Fred Stewart (1938–1968), Paul David (1948–1971), and Larry Lock (1952–1978) in farm administration; Mike McLaughlin (1973–present) and Bob Pountney (1971–present) in the farm crew; Howard Armstrong (1942–1977) in mechanics; and Mike Goetz (1946–1976) in carpentry.

The next Director was Dr. Fred Kristjansson, who transferred to Lacombe from the position of Director of the Ottawa Research Station (1971–1976). During his 3 years at Lacombe there was considerable reorganization of Agriculture Canada. The major change affecting the Research Branch was decentralization of program administration, with all stations in British Columbia and the Prairie Provinces coming under the direction of a Western Regional office located in Saskatoon. New opportunities for agricultural research also became available under the Alberta program "Farming For the Future" funded under the Heritage Trust. This program enabled several of the plant scientists at Lacombe to establish new research and demonstration projects.

The area of the station was increased in 1979 with acquisition of the Naumenko property adjacent to Lacombe Lake. This completed an exchange for a portion of the Research Station land adjacent to the town (immediately south of the golf course) annexed in 1972 for Lacombe's residential development under the auspices of the Alberta Housing Corporation.

Two changes were made in internal organization of the station. Historically, the operational staff for plot work, horticulture, and livestock had been responsible to the section heads involved, with general farming operations supervised by the farm foreman who reported to the station Director. This was changed when Larry Lock, the farm foreman, retired in 1978. His successor, Dick Gillespie, was made responsible for all operational staff. Howard Fredeen, head of the animal science section since 1955, resigned this position in 1979 and the section was divided into four parts: animal breeding under Jack Newman, meats under Archie Martin, statistics and computing under Milton Weiss, and economics under Bob Jolly. The latter resigned in 1979 for a post with Iowa State University and this area of work was not resumed. Veterinary science, which had been a part of animal science, terminated in 1977 when John Bradley transferred to the Animal Diseases Research Institute at Lethbridge.

Another change made in 1977 was the transfer of Leon Jarmoluk, who had been a most productive member of the animal science section, to the position of station photographer. One of his new duties was preparation of the historical photographic record of the station. Leon died early in 1982 but this latter work, continued by Jeanette Walker, is represented by the pictorial record provided by this history.

Dr. Kristjansson returned to Ottawa in 1979 and Doug McBeath, then head of the crop management and soil section, was appointed Acting Director. He held that position for a year and then transferred to Manitoba as Director of the Morden Research Station.

July 1980 saw the appointment of the sixth Director since the founding of the Lacombe Experimental Station in 1907. Dr. Don Waldern was no stranger to Lacombe, having been born in the town and raised in the area. He brought to the job a wide range of research experience in nutrition and physiology of swine, dairy cattle, and beef cattle and in forage crop

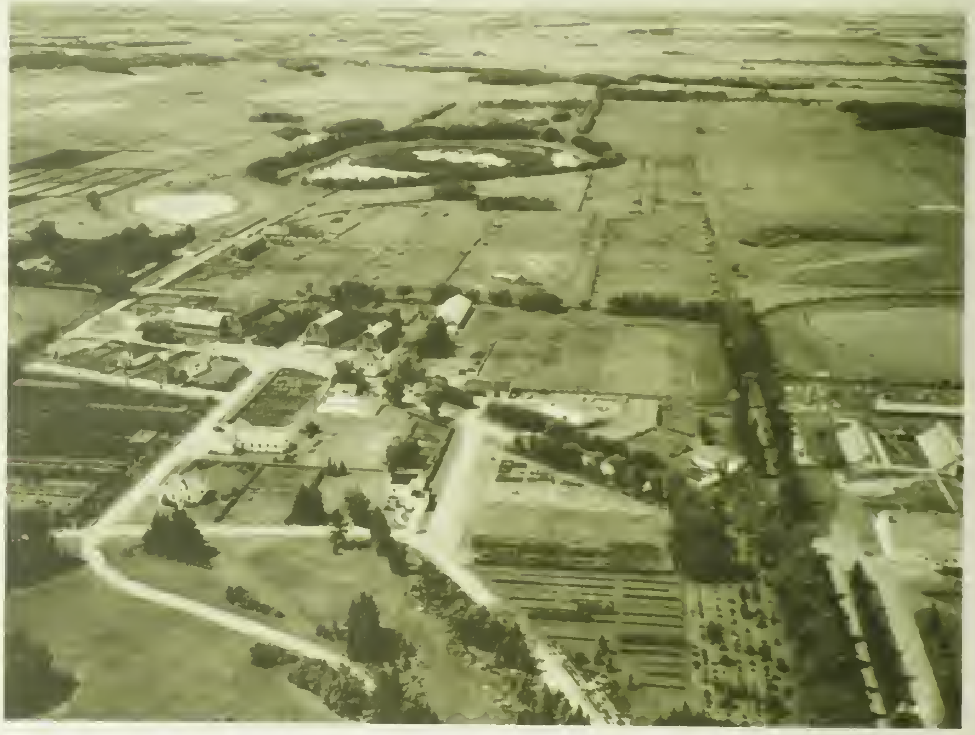
above
Dr. Fred Kristjansson, Director Lacombe Research Station, 1977–1979.

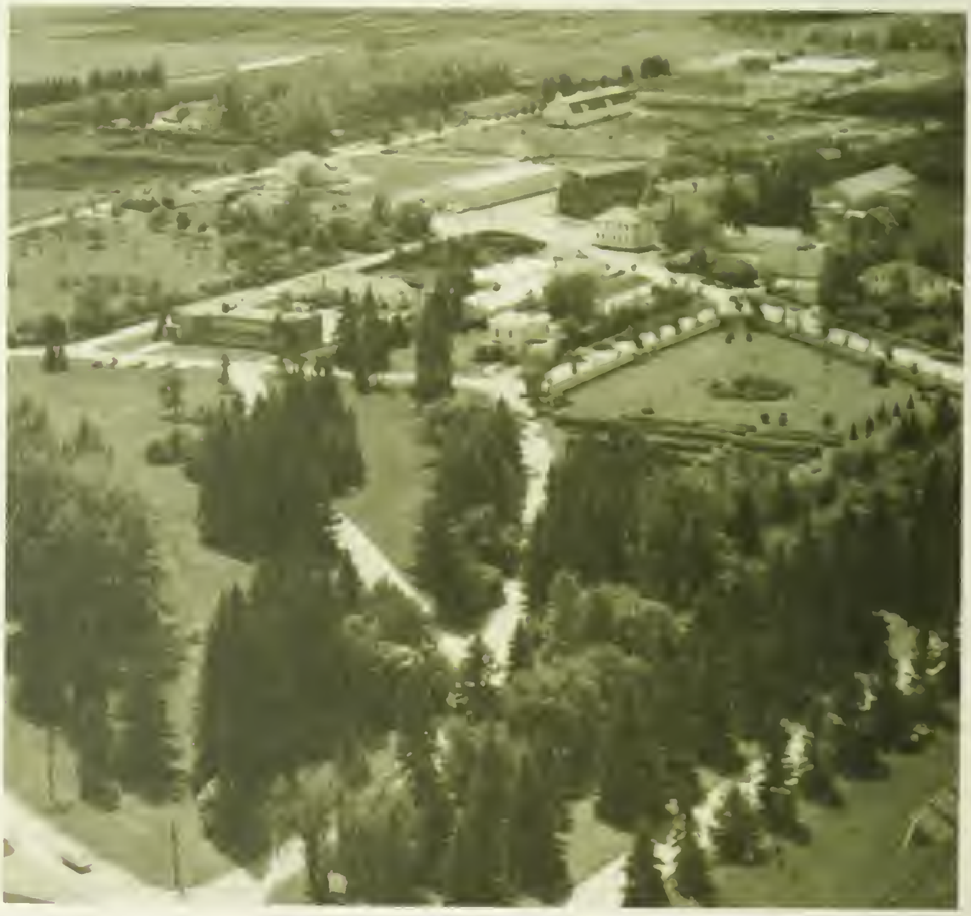
below
Mike Goetz (1946–1976) was responsible for building renovations, maintenance, and many substantial building projects during his 30 years as head carpenter.

right
Research Station in 1956. Experimental hedges established in the early years are in the foreground at right, the livestock pavilion and Agricultural Society show barns at right. The T-shaped building at center left is the 1948 office building, and the boardinghouse, now the animal science office, is the large building just left of center.

below
Research Station from the same viewpoint in 1976. The office built in 1959 is at left center, the 1912 dairy barns have been replaced by the machine shop, and several new piggeries have been added in the left background.

opposite page
Ross Cairns, officer-in-charge at Vegreville 1957–1979, and staff members.





utilization, gained as a research scientist for Agriculture Canada at Prince George and Agassiz in British Columbia and as an Associate Professor of Animal Science, Washington State University, Pullman, Washington. He obtained additional experience in research management as Director of the Kamloops Research Station and as the first program specialist appointed to the newly created Western Regional office of the Research Branch in Saskatoon.

Don Waldern, because of his experience at the regional office, was quite familiar with the background and changing organizational structure of the Department and the Research Branch. There he had been instrumental in developing a 5-year cyclical program review system incorporating an external review process common to all the western stations. This system, featuring identification of short-term and long-term research priorities and development of research proposals with research program review by representatives of industry, extension services, and scientists within and outside the Branch, was designed to achieve coordination of research on top-priority issues. Immediately after his arrival at Lacombe, Don initiated this in-depth external review process with the crops and other programs. In addition, he made a major contribution to the development of a new project outline system for the Branch while at regional headquarters, and toward completion of the new Lacombe Meats Research Centre both as regional representative on the planning committee and as station director.

There were many staff changes in the period 1976–1982. Death claimed two long-time staff members, Henry Friesen in 1977 and Don Walker in 1981; retirements included Ross Cairns (1979), Len Folkins (1980), Harvey Allen (1981), and Don Dew (1981); and Doug McBeath transferred to Morden in 1980. New appointees were Austin Murray (meats research) in 1977; Alan Tong (animal breeding), Ashley O'Sullivan (weed science and head of the crop management and soils section), and Gordon Greer (meats research) in 1978; Claude Caldwell (plant physiology), Martin Carter (soils and officer-in-charge, Vegreville), Sudhkev Malhi (soil chemistry), and Richard Pearen (crop physiology, Vegreville) in 1981; and Vern Baron (forage physiology) in 1982.

Results obtained in the continuing studies of herbicides by Ashley O'Sullivan have contributed to recommendations for use of many recently registered products and some currently on the verge of registration. The Lacombe research has also contributed to national recommendations for the use of specific herbicide mixtures. In addition to these herbicide studies, the crop management and soils section is conducting work on minimum tillage, control of Canada thistle, and weed competition, with funding assistance from the Farming for the Future program. One study on weed competition recently completed by Don Dew demonstrated that the date of seeding closely influences the various leaf stages of cereal crops. From these results he developed charts that utilized date of seeding, rather than visual inspection of crops, as the basis for determining the timing of herbicide applications. His prediction methods, estimated to be accurate 80% of the time in most areas, are now used by cereal producers, herbicide companies, and extension staff to increase the effectiveness of herbicide applications and reduce damage to the crop.

Future plans in crop management and soils include greater emphasis on soil conservation and reduction of the energy needs and capital costs of crop production. Specific areas of interest include minimum tillage, crop rotations, growth regulators, weed control, fertilizer application, and moisture conservation integrated in a program to optimize the crop production potential of the several soil types, including Solonetzic soils, represented in the area served by Lacombe. A multidisciplinary approach has been developed involving all the crop and soil scientists at Vegreville and Lacombe. The Vegreville substation will continue to focus on tillage, cropping systems, soil fertility requirements, and forage crop evaluation and management to optimize the productivity of Solonetzic, Luvisolic, and Chernozemic soils. Major renovation of the facilities at Vegreville has been planned for 1986–1987, and a new crops service building to provide additional greenhouse facilities, enlarge the work area, and house all support staff is projected for 1986–1987 at Lacombe.

In the period 1976–1982, the cereal breeding program conducted by Martin Kaufmann and Harvey Allen resulted in the two new cultivars of oats and one of barley described in the previous chapter. Random oats, licensed in 1971, has become the most important cultivar in northern Alberta, where in 1980 it accounted for 35% of the oat crop area. Athabasca, licensed in 1978, is the earliest of all oat cultivars available to producers and Cascade, licensed in 1979, has exceptional promise for areas where extreme early maturity is not a premium requirement. Several new oat and barley lines have recently been advanced for cooperative testing. Seed of the new barley variety Diamond, licensed in 1982, has been widely distributed throughout Western Canada to growers for seed increase.

Research on root rot of barley continues and screening of barley lines for resistance to the pathogens involved will continue as a component of Lu Piening's program. In 1976, his research demonstrated that winter losses of winter rye and wheat were due to several low-temperature molds which killed the young plants in March before snowmelt occurred. A spectacular disease of wheat, head melanosis, is currently under study. Two cultivars, Park and Thatcher, have been identified as most susceptible to this disease which appears to result from a bacterium found in both soil and seed. Work is currently under way to breed a line of Park wheat that is not susceptible to the disease.

Uses of annual forage crops for silage, hay, and pasture are being investigated under a program, partially funded by Farming for the Future, conducted by Bill Berkenkamp. Part of this work is to breed early-maturing fababeans. Expansion of the work with annuals required a reduction in the research with perennial forages. However, testing continues with lines of alfalfa and bromegrass; a timothy breeding project begun in 1958 has been completed and a birdsfoot trefoil breeding project to improve winterhardiness is well advanced. Research on diseases of forage crops includes surveys of the distribution and severity of damping-off in alfalfa and studies on control procedures. Forage physiology research conducted by Vern Baron includes examination of growth characteristics of new grass cultivars and the development of new techniques, involving use of preservatives, to reduce forage losses during harvesting and storage of hay crops.

Milton Weiss, in 1977, initiated documentation of an improved interactive computer system termed the programmable digital processor. In 1981 the proposal was adopted by the region and four Branch locations in Western Canada were converted to the new system, known as PDP 11/44. This system opened the door to automated data entry systems to increase labor efficiency and reduce transcription errors. The crop management and soils section, largely through the efforts of Dave Friesen and Lawrence Fobert, initiated the use of small portable data entry terminals in 1981. The second generation of remote data entry terminals, featuring automatic recording of animal weights, is currently under test with beef cattle.

In the foreign cattle breed evaluation (FCBE) studies of the beef research program, the F_1 females sired by Charolais and Simmental bulls proved much superior to the conventional Hereford × Angus cross in lifetime reproductive performance. However, the most important finding was that high milking potential of the female, although advantageous under intensive management, lowered conception rates under rigorous range conditions. This experiment concluded in 1978; a second project to measure breed cross differences in feed requirements for maintenance and calf production ends in 1982; and a third project to evaluate the reproductive performance of backcross females is in progress. The highest-producing F_1 females from the original study are now being assembled at Lacombe for genetic studies of reproductive efficiency.

Alan Tong's work on interpreting environmental and genetic differences in the performance of beef cattle tested under the national record of performance program has provided technical support to the national testing program. He is also investigating ultrasonic and other techniques for live-animal carcass evaluation and techniques for automated recording of feed intake by individual animals.

Selection for lean growth rate in swine proved an effective technique for improving the efficiency of feed conversion and confirmed the validity of a simple and practical indexing procedure based on two traits, back fat and growth rate. Use of this index by the national hog testing program received industry approval in 1981. The feasibility of lean production from heavy hogs was examined in a series of studies conducted cooperatively by Bob Jolly, Archie Martin, and Al Sather. Economic models incorporating carcass value along with all production costs identified an optimum weight range of 100–110 kg at slaughter. The present work includes studies of pig behavior in relation to penning density, and feeding methods as related to the measurement of genetic differences in growth and carcass traits. Investigations also continue on the genetic relationships of lean content of the carcass with meat quality, leg soundness, and reproductive performance. These studies, like those of previous years, emphasize problems important to practical pig production. Breeding research with pigs and small animals was expanded in 1981 in cooperation with the postgraduate student program of the Department of Animal Science, University of Alberta.

Under the leadship of Archie Martin, a team approach has been developed to evaluate the physical, histological, chemical, and microbiological factors that influence meat quality. Noteworthy in quality research was the work by Gordon Greer and Les Jeremiah on lengthening the shelf-life of meat held in retail display coolers. Their results of surveys of retail outlets and laboratory experiments showed that the temperature of the steaks in retail displays averaged about 9°C higher than that indicated by the retail case thermometer. As a result there was rapid bacterial growth and shelf-life was only 2 to 3 days. However, bacterial growth was reduced and shelf-life of the steaks was extended to 5 days when steaks were removed from display at the end of each work day and stored overnight in a walk-in cooler at 1°C. Reducing the retail-case temperature to about −9°C lowered steak temperature to 2°C and shelf-life was extended to 8 days. By adoption of either of these practical methods of temperature control, retailers can reduce spoilage losses and enhance consumer satisfaction with the meat purchased, because it will keep better in home refrigerators.

Other studies conducted by Les Jeremiah indicated that uncured pork loin chops and shoulder roasts could be successfully frozen and stored at −30°C for more than 196 days, and cured ham steaks and bacon slices stored for 196 and 112 days, without deterioration of palatability. His results also indicated that freezer paper, aluminum foil, polyethylene bags, and retail wrap were equally effective in preventing deterioration in meat quality. When thawed and displayed, these products were found to be quite acceptable in appearance to the consumer with a retail case-life comparable to the fresh product.

Work continues on techniques for predicting the yield of trimmed retail product from the carcass and for determining the relationships between measures of lean quantity and quality. A Canada-wide project to reexamine the national hog carcass grading standards in light of these considerations was completed during 1978. Planning and interpretation of this major project was under the leadership of Archie Martin and Howard Fredeen. The opportunities for meats research in the future will be greatly enhanced by construction of the meats research laboratory–slaughtering facility scheduled for completion by 31 July 1983.

* * *

CHAPTER 9

Industry and Community Service

Mr. DeLong, during his period as Superintendent, actively encouraged his professional staff to maintain close liaison with all facets of the agricultural industry. He had three main objectives. One was to expedite extension—a process which in later years was called technology transfer. Another was to foster among his staff a concern for, and awareness of, all problems considered important by producers, agricultural extension workers, and others directly or indirectly involved in animal and plant production. And third was his desire to foster cooperation among his staff in planning and interpreting research results, the forerunner of what is now termed interdisciplinary research. While he avoided any formal definition of this policy, his own activities and his informal discussions with the staff provided strong leadership.

Jack Stothart continued and built on this philosophy of industry service. He supported his staff in many basic research activities but the underlying emphasis was on statistically solid experimentation that responded to real needs of the industry. Like Mr. DeLong, Jack avoided formal directives but he always provided leadership by example and by informal coffee table sessions. Staff scientists were encouraged to develop and maintain strong ties with producer organizations, to attend producer and industry meetings as guest speakers or observers, and to work closely with industry leaders in planning research activities. Producers came to recognize the station as a source of sound advice and as a research center where scientists would respond quickly to new or potential industry problems.

The net result of this informal policy was the gradual growth of the reputation of the station and its staff. Scientists were appointed to membership on local producer committees, then to regional, national, and international committees. These activities broadened their perception of industry problems and vastly enhanced the relevancy and impact of their research programs. Examples of national importance included the development of the national record of performance (ROP) testing programs for swine and beef cattle and the carcass grading systems for beef and pork.

Jack Stothart was technical adviser to the National Advanced Registry Board for swine from 1946 to 1955. Howard Fredeen was appointed to the board in 1956, became a member of its genetics advisory committee when it was formed in 1967, and was committee chairman 1973–1979. Allan Sather is currently chairman of the committee. Lacombe was also represented on the National Animal Breeding Committee (1958–1964) which, in its brief life, developed the designs for the national performance testing programs now in operation for both beef and pigs. These programs were based in large measure on research conducted at Lacombe. Jack Newman was appointed to the National Genetics Advisory Committee for ROP (beef cattle) in 1973 and served as chairman for the period 1975–1981. Alan Tong was appointed to this committee in 1978. Another service to the national testing program for swine was the development by Milton Weiss of the computer system for editing, processing, and reporting the test results to the breeders. In 1976, the Department assigned full responsibility for data bank maintenance and reporting to Lacombe. Milton and one assistant, Lea Purves, performed this central role for the ROP (swine) program until 1979 when the program was transferred back to Ottawa.

Indicative of the international stature earned by Lacombe during Jack's tenure as superintendent was the steady stream of delegations and distinguished visitors from various Commonwealth countries, Europe, East Asia, Latin America, and the United States who came to view first-hand the work under way at the station. These visits were reciprocated when Jack Stothart was invited to present a series of lectures on swine production in Cuba in 1972 and Doug McBeath served on a 3-year agricultural mission to India in 1973–1975. In 1975, Howard Fredeen was a member of the first Canadian agricultural mission to visit the People's Republic of China. Jack Stothart's visit to Cuba culminated in development of a joint Canada–Cuba program for exchange of scientific information on animal production. A joint committee including the Canadian University Students Overseas organization was named in 1976 with Howard Fredeen as chairman. Cuban scientists who have studied at Lacombe since that date included Diana Bustillo and Amado Cervantes in meats science and Carmen Rico and Joaquin Gomez who earned their doctorate degrees in animal breeding from

above
Postdoctorate students Dr. Bernt Bech Anderson (Denmark) and Dr. Akira Nishida (Japan) in 1972.

Leon Jarmoluk (1957–1982) who gave outstanding technical support to animal science and was station photographer at the time of his death in 1982

the University of Havana on the basis of studies at Lacombe. Visiting postdoctorate fellows who pursued studies at Lacombe in animal genetics and meats included Drs. Fujishima (1968–1970), Nishida (1972–1973), and Mikami (1975–1976) from Japan, and Drs. Bech Anderson and Mandrup Jensen of Denmark (1973). Dr. Sharma (India) was a postdoctorate student in weeds research in 1975–1976.

All scientists on the staff have been active members of scientific and professional societies and have had major responsibilities in executive positions. Jack Newman, for example, took many executive positions with the Canadian Society of Animal Science starting as secretary (1963–1966) and culminating as President (1972–1973). He also chaired the Advisory Council for Scientific Affairs of the Agricultural Institute of Canada (AIC) in 1973–1975 and was Vice-President of the AIC in 1974–1975. Others who served on provincial or national councils of AIC included Don Dew, Howard Fredeen, Doug McBeath, Don McFadden, and Jack Stothart. Of the several staff members who have served in an editorial capacity for scientific journals, the longest continuous service was given by Howard Fredeen whose 3-year term as Chairman of the Editorial Policy Board for the three Canadian journals of agricultural science (1971–1974) culminated 14 years of work with these journals.

Lacombe scientists have also been appointed to membership on many Canada committees including those for animal breeding (Fredeen, Newman), cereal breeding (McFadden, Kaufmann, Allen), grain diseases (Piening), meats (Fredeen, Martin), and weeds (Friesen, Dew). Activities with these committees, which provide recommendations to research planners in governments, universities, and industry, coupled with comparable roles on various Western Canada and Alberta advisory committees, have ensured a continuous contribution from Lacombe to policy recommendations for both production practices and research directions. Other industry liaison activities have included membership of Lacombe staff on breed improvement committees for both cattle and pigs, and technical advisory committees of the Canadian Cattlemen's Association and the Canadian Pork Council. The conception-to-consumer program of the Canadian Charolais Association was, itself, an indirect product of this liaison. Howard Fredeen and Milton Weiss have been technical advisers to this program since its inception in 1968.

Combined with this multitude of professional activities has been a strong and continuous thread of service to the local community. In the early years, active participation in community affairs was limited to professional staff, with Mr. Hutton and Mr. DeLong particularly active as executive members of the Board of Trade and Lacombe Agricultural Society. This changed with the formation of the first service club (Lions) in 1938, and the men who served as presidents of this club included Jim West (1940), Happy Wilson (1945), Don McFadden (1950), Fred Stewart (1955), Jack Stothart (1961), Leon Jarmoluk (1974), and Martin Kaufmann (1975). Past presidents of the Lacombe Rotary Club have included Henry Friesen (1973), Don Dew (1977), Lu Piening (1979), and Huib Doornenbal (1980). Fred Stewart and Harry Leggett were key figures in organizing the first Lacombe Lions ball tournament, an annual event that from the outset attracted attention from teams throughout the western part of the continent; and several staff members, including Harry Leggett and Dick Gillespie, gave many years of service as coaches of minor hockey. Don Walker conducted the junior community band for 8 years and Jack Newman currently directs the senior community band. Martin Kaufmann was Commanding Officer of the Lacombe Cadet Corps for 15 years, a position now held by Dave Friesen, and John King also assisted with cadets. Staff members elected as town councillors were Mr. Hutton (1911–1912), George Ramsay (1952–1961), Don Dew (1963–1966), Don McFadden (1967–1971), and Henry Friesen (1971–1974). After retirement, Don McFadden was again elected to Town Council and served as Mayor of Lacombe for 1974–1977. Dick Gillespie served as chairman of the Lacombe Police Commission from 1977 to 1981.

Many honors have come to Lacombe scientists in recognition of their contributions in the service of agriculture. Most recent was the 1981 presentation to Martin Kaufmann of an honorary life membership in the Canadian Seed Growers' Association. He was the second recipient of this award from Lacombe, the first being Don McFadden in 1964. Harvey Allen, in recognition of his leadership and contributions to western horticulture, was pre-

sented with the Centennial Gold Medal in 1978 by the Alberta Horticultural Association. Jack Stothart (1966) and Howard Fredeen (1967) were elected as fellows of the Agricultural Institute of Canada. Howard Fredeen also received the Public Service Merit Award in 1969, the Award of Excellence by the Genetics Society of Canada in 1978, and the University of Saskatchewan Alumni Award in 1981. Perhaps the most notable award was that presented to Henry Friesen by the Weed Science Society of America. In 1974 the society conferred on him the Outstanding Extension Worker's Award in recognition of his scientific leadership and his high competence in disseminating his results to producers. Two years later they gave him further honor by electing him a fellow of their society.

But these honors have not been confined to the scientists. George Ramsay was awarded an honorary life membership in the Alberta Horticultural Association in 1969, an award that recognized his capabilities in horticultural extension and his service to the Provincial Association. And in 1969, Bev Harrington was elected an honorary life member of the Canadian Lacombe Breeders' Association. This was a fitting tribute to the man whose singularly painstaking and conscientious work had been pivotal to the success of all swine work undertaken during his 44 years as swine herdsman.

Evolution of the research program at Lacombe has been a continuous process since the station was established in 1907. Acceleration of the process since 1976 has been due in part to staff changes, but a major influence has been the increasing pace of evolution of the agricultural industry itself. But the basic objective of the Lacombe Research Station continues to be service to agriculture. In this context it is fitting to conclude by quoting Dr. Saunders, founder of the system known today as the Research Branch of Agriculture Canada:

"There is probably no employment which engages man's attention that requires more skill and more general information to carry it on than farming. Competition is keen. . . and the farmer must turn to practical account every advantage within his reach bearing on the improvement in the quality of his products and in lessening the cost of their production if he is to maintain and improve his position."

This outlook is as valid today as it was when written in 1905. And of equal validity is Dr. Saunders' original concept that the role of agricultural research is to serve the producers in their efforts to enhance food production. This has been, and will continue to be, the objective of the Lacombe station.

above left
Henry Friesen with the Weed Science Society of America award as outstanding extension worker in 1974.

above right
Mrs. Seymour Edmunds (1919) was the honored guest at the staff reunion held 30 April 1982, on the occasion of the station Diamond Jubilee. Happy Wilson (1926) is to her right and Bev Harrington (1924) to her left. Standing from the left are: Bill Jardine (1924), Lin Bolton (1927), Campbell (Tom) McBeath (1924), Don McFadden (1928), Hugh McFadden (1930), and Frank Brewster (1930).

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Bibliography

Anonymous. 1924. The organization, achievements and present work of the experimental farms. King's Printer, Ottawa.
Anonymous. 1939. Fifty years of progress on Dominion experimental farms. King's Printer, Ottawa.
Anonymous. 1967. Canada Agriculture, the first hundred years. Queen's Printer, Ottawa.
Anonymous. 1967. The Lacombe story. Howard Fredeen, ed. The Lacombe Globe.
Anonymous. 1972. Wagon trails to hard top. Lacombe Rural History Club. D. W. Friesen and Sons Ltd., Calgary, Alberta.
MacEwan, Grant. 1969. Harvest of bread. Modern Press, Saskatoon, Sask.
Puffer, Gordon P. 1976. A giant among pioneers. Parkland Colorpress, College Heights, Alberta.
Shepherd, George. 1967. Brave heritage. Modern Press, Saskatoon, Sask.

Sources of information included minutes of the Lacombe Board of Trade from 1904 to 1908, issues of *The Lacombe Advertiser*, *The Western Globe*, and *The Lacombe Globe* dating from 1904, annual reports from the Lacombe Experimental Station dating from 1908, archival material from the Public Archives, Ottawa, and Rutherford Library Archives, University of Alberta, and conversations with early employees of the station. Of the latter, specific thanks are due Mrs. Seymour Edmunds (1907–1951), Bill Jardine (1924–1946), Tom McBeath (1924–1928), Bev Harrington (1924–1970), and Jim West (1929–1969).

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Epilogue

Publication date for the Lacombe Research Station history, commemorating in February 1982 the 75th year since the founding of the station, will occur but two years before the Centennial anniversary of the founding of the Experimental Farms Service, 1986. Thus, in order to make this document as current as possible in relation to the Centennial celebrations, a brief update is provided covering changes in facilities and staffing appointments not mentioned previously in the history.

An extensive evaluation of the adequacy of buildings and laboratories was undertaken in mid-1981 to establish both short- and long-term priorities, which were subsequently approved by the Department, to upgrade or replace the many outdated research facilities and buildings at Lacombe and Vegreville. Minor construction projects approved included conversion of the two mouse laboratories in the administration building (No. 21) to instrument and forage physiology laboratories (completed in 1982); conversion of piggery building No. 56 to a new modern farrowing facility (1983–1984); conversion of the old office building (No. 20) to a library–meeting room–lunchroom complex (1984–1985); and construction of a new crops services building for Vegreville (1986–1987). Major construction projects approved for Lacombe as part of the Department's long-term building plans included a new crops services building (1986–1987), a new swine breeding barn, and another wing for the main administration building (No. 21). In addition, the new Meats Research Centre which includes a laboratory–slaughter plant complex was occupied in November 1983, with the first slaughter operation to commence in April 1984.

Administration staff departures included those of Bill Murray (1972–1979) and John Jones (1979–1983), both former administrative officers, and Joy Otto (1976–1982); office staff appointments included those of Margaret Reber (1978), Donna Pierson (1980), Irene Thauberger (1980), Bev Moore (1981), Bertha Griffin (1982), and Leith Damiani (1983). General farm management staff joining the station included Pete Anderson (1977), appointed farm foreman in 1980, and farm crew member Noel Moorhouse (1980); carpenters Randy Cappis (1976) and Vern Carpenter (1980); and stationary engineers Lance Forsberg (1975) and Bruce Webb (1982) in heating and power. New staff in the beef unit included Roger Polson (1978) and Glen Flewelling (1978), and in the swine unit, Karen Brassington (1975). New plot support staff included Susan Smith (1980) and Wayne McKeen (1982). Technical staff appointed were Denise Orr (1974) in cereals; Bryan Dilts (1977), Lorna Skyrme (1980), Penny Nemeth (1981), and Wayne Robertson (1981) in meats research; Dawn Sumner (1973) and Trudy Grimson (1978) in animal science; Brenda Walper (1978) in soils; and Ken Foster (1982) in crop physiology. Scientists who departed included Martin Carter who transferred to the Charlottetown Research Station in 1982 and Claude Caldwell who took a position with the Nova Scotia Agricultural College in 1983.

Our long-term staff members mentioned in earlier chapters and the many new members listed above form the backbone of our present research and administrative support functions. Without their continued efforts our new multidisciplinary research programs would not be the success they are today.

Finally, two of our long-term highly productive senior research scientists will be retiring in the summer of 1984. Dr. Martin Kaufmann, our oat and barley breeder, is retiring after 28 years of service while Dr. Howard Fredeen, swine and beef geneticist, is retiring after 37 years of service. Both men have contributed greatly to our basic knowledge of Agricultural Research and to the agricultural industry of Canada and indeed world wide. Their many contributions are recorded in this history.

D. E. Waldern

D.E. Waldern
February 1984

Canada